A TAXONOMIC REVISION OF THE FAMILY GELASTOCORIDAE (HEMIPTERA)

by

Edward L. Todd
A.B., University of Kansas, 1947
M.A., University of Kansas, 1948

Submitted to the Department of Entomology and the Faculty of the Graduate School of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Advisory Committee:

Chairman

October, 1950

ACKNOWLEDGMENTS

The writer wishes to take this opportunity to express his appreciation for the assistance received from various sources during the progress of this study.

To Doctor H. B. Hungerford of the University of Kansas, who suggested this study to me, I am especially grateful. Not only has he generously given his time to the discussion of various problems that occurred from time to time, but also, through his influence specimens were received from most of the major collections in this country and from several European museums. Further, his notes on the specimens in many of the European museums have greatly facilitated many aspects of this investigation.

To Doctor C. D. Michener of the University of Kansas, I am deeply indebted for the encouragement he has given to me and for the consideration he has given to the many questions of procedure and taxonomy.

To the others at the University of Kansas, and especially to Doctors Kathleen Doering and R. H. Beamer, I am sincerely appreciative for their willingness to give assistance at all times.

Thanks are due to Doctor O. Lundblad of the Museum of Stockholm, Stockholm, Sweden, through whose kindness the writer was able to study those types of Douglas Melin which

are located in that museum; to Doctor R. L. Usinger of the University of California, who not only sent material from his personal collection, but also made a number of comparisons between drawings sent by this writer and types located in the British Museum in London, England; and to Doctor Eugene Seguy of the Museum of Paris, for his comparison of a specimen with a type located in that museum and for sending a paratype of one of the species I had not been able to study.

I would also like to thank the curators of the various museums and collections who have provided specimens for study. As it has been necessary to abbreviate the names of these institutions in the distributional data of the descriptions in this work, a list of these institutions and the abbreviations used is given at this time.

United States National Museum at Washington, D. C., (USNM); American Museum of Natural History at New York City, (AMNH); Museum of Comparative Zoology at Harvard University, Cambridge, Mass., (MCZH); California Academy of Science at San Francisco, Calif., (CAS); Philadelphia Academy of Science at Philadelphia, Penn., (PAS); Carnegie Museum at Pittsburgh, Penn., (Car. Mus.); Museum of Prague, Prague, Czechoslovakia, (Mus. Prague); University of Michigan at Ann Arbor, Mich., (Mich. Coll.); and Purdue University at Lafayette, Indiana, (Purdue Coll.). All specimens not indicated by one of the above abbreviations are located in the Francis Huntington Snow Entomological Collection at the University of Kansas.

TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

TABLE OF CONTENTS - Continued

INTRODUCTION

The family Gelastocoridae, as considered in this work, is composed of two subfamilies, each of which has within its limits a single genus. The total number of species is 69, of which 13 belong to the genus Gelastocoris and 56 to the genus Nerthra. The identification of the species in this family has always been most difficult. This has been due, in part, to the similarity of many species and the extreme variability of color and morphological characters within a single species. On the other hand, the difficulty has, in part, also been due to the inadequacy of many of the original descriptions, especially of the earlier workers, and the lack of comprehensive keys. It has been the aim of the writer to assemble the literature pertaining to the Gelastocoridae; to present the known facts concerning the biology and the ecology of the species of this family; to establish techniques which would facilitate the study of the Gelastocoridae; to evaluate the characters used in the taxonomic study of these insects; to study geographical distribution as an aid to our knowledge of their phylogeny; to determine the phylogenetic relationships between the Gelastocoridae and other cryptocerous Hemiptera; to discover the natural relationships among the species within the family; and finally to present keys which would

permit the determination of genera and species of this difficult family. The accomplishment of these aims has not been an easy task. One of the greatest obstacles has been the inaccessibility of type specimens. The types, for the most part, are scattered in the various European museums. The small amount of material available for study, particularly of Eastern hemisphere species, has been another hindrance. Even so, the writer has been able to study what is undoubtedly the largest collection of Gelastocoridae ever assembled. In addition to the large collection in the Francis Huntington Snow Entomological Collection at the University of Kansas, the writer has received, through the influence of Doctor H. B. Hungerford, specimens from nearly all the major entomological museums in this country and from some of the museums in Europe (Museum of Stockholm, Museum of Prague, and the Paris Museum). Furthermore, Doctors R. L. Usinger and Eugene Seguy have made comparisons of type material for the author. In this study, it has been necessary to place in synonomy a number of genera, which in my opinion were not based upon good generic characteristics. It was the hope that some additional generic names could be retained, at least as subgenera, but, as will be explained at another point, some of the supposed generic characters must have arisen independently in rather distantly related species and therefore, do not delimit natural groups. An artificial classification of that type would have facilitated the

formation of keys to some extent, but would not have been of any value as far as the development of a natural system of classification is concerned. It is the hope of the writer that this work will simplify the task of species determination and especially, that it will stimulate others to undertake further studies concerning the taxonomy, biology and ecology of the Gelastocoridae.

BIOLOGY AND ECOLOGY.

Little is known concerning the biology of the Gelastocoridae. The life history of only one species, Gelastocoris oculatus (Fabricius), is known to any extent. Doctor H. B. Hungerford's fine study of this species (7) has shown that the oval eggs are deposited in sand with the cephalic end uppermost. The egg, which is white when dry and amber or ferruginous when moistened, blends perfectly with the sand. One female probably deposits as many as 200 eggs during a season. Doctor Hungerford recovered 192 nymphs and eggs from one female. The number of eggs laid per day may vary from 1 to 13. The incubation period is from 12 to 15 days. There are five nymphal instars. The total developmental period is from 60 to 100 days. In the laboratory, mating occurred almost daily from May to November, but it is not known whether this is true when the insects are in their natural habitat. Millspaugh (14) infers that G. cucullatus

Martin (= G. hungerfordi Melin) has a definite period during which mating is more commonly observed than at other times during the season. The exact number of generations of G. oculatus (Fabricius) is unknown, but probably varies from one in the extreme northern part of its range to several in the southern part of its range. It is not recorded in the literature how G. oculatus (Fabricius) and other species pass the winter in regions where this season is unfavorable to an active mode of life. It is, however, fairly certain that they overwinter in the adult stage; undoubtedly they seek out protected places to pass the winter. In addition to Hungerford's study of G. oculatus (Fabricius), Kevan (8) has studied the life history of Nerthra nepaeformis (Fabricius) in Trinidad. Although he was unable to rear these insects through their complete life cycle, he was successful in rearing captured fifth instar nymphs through to adults. Adults were observed mating, but no eggs were obtained. Except for captured nymphs of various instars, which cannot be identified in the light of present knowledge, nothing is known concerning the life cycles of the other species of this family.

While all the species of the Gelastocorinae are found on the mud or sand banks of streams, ponds, etc., this is apparently not entirely true for all the species of the Nerthrinae. Melin (13) wrote; "Of the three

specimens of N. bipunctatus I collected in Peru, the male lived in a decomposed trunk in a 'chacra' of bananas, the female on the ground in the forest amongst dry leaves, and the larva on a trunk in a clearing." Kevan (l. c.) states: "M. nepaeformis has been taken commonly, both by writer, and by Dr. H. B. N. Hynes, in a small banana plantation attached to the Imperial College of Tropical Agriculture, St. Augustine, Trinidad, during both the wet and the dry seasons of 1941-1942. There is neither standing nor running water anywhere in the vicinity of this plantation, and, in the dry season, the ground becomes parched and dry. The insects are most readily found under debris, such as heaps of dry grass or old pawpaw stumps, and seem to spend much of their time burrowing in the soil, where they are common also, though less easily detected, while nymphal exuviae have often been found underground. In the laboratory, too, they will readily burrow in moderately loose soil. All their time, however, is not spent in this manner, for the writer has swept the species from low vegetation on to which it had climbed, presumably in search of prey." According to Torre-Bueno (19), Biolley found a specimen of N. fuscipes (Guérin-Méneville) in a rotten log in Costa Rica in December of 1904. Maxwell-Lefroy (12) writing about N. indica (Atkinson) states: "..it is found on grass paths, on the soil and under stones, as well as on hard roads; it is not aquatic and is possibly predaceous on small insects."

Apparently all species are predatory as evidehced by the raptorial front legs. Their prey consists of small insects and especially the larvae of those insects which are found in association with the Gelastocorid species. Kevan has reported that in the laboratory N. nepaeformis (Fabricius) preferred termites as food, while small moths and beetles were not received with favor.

In regard to the burrowing habit of certain species, an observation of Doctor H. B. Hungerford on G. oculatus (Fabricius) is of interest. Doctor Hungerford states that he has seen broad, sandy, barren flats where toad bugs lived become inundated by rapid currents of water for a few hours; nevertheless, when the water receded and the sun came again, the toad bugs were there as before. Since there was neither vegetation nor sizable stones for their anchorage, he supposes that they "dug in". Although G. oculatus (Fabricius) has well-developed wings, the writer has never seen a specimen fly. When they are disturbed, they will either hop away or crouch down against the mud or sand, apparently depending upon their coloration to protect them from detection. The facts that they burrow and that they do not often fly perhaps will explain, in part, the reduction of the membrane of the hemelytra and of the entire hind wing in some species. The fact that some species have the hemelytra united may also be due to the above habits. At least, it is the opinion of the

writer that any mutation toward the brachypterous condition would not be harmful as far as their habits are concerned.

TAXONOMY

Before consideration of characteristics which have been used by the writer, it seems best to present a brief review of the literature, placing special emphasis upon the principle workers and upon the dates and the authors of the original generic and subgeneric descriptions.

In 1802, Latreille established the genus Galgulus for Naucoris oculata Fabricius, 1798. Billberg, 1820, first used the name Galgulidae (Galgulides). For nearly a century thereafter the family was known by this name. Thomas Say, 1832, described a new genus and species, which he named Nerthra stygica. He apparently was separating it from Naucoris and does not mention the Galgulidae. One year later, in 1833*, Laporte described the genus Mononyx with Naucoris raptoria Fabricius, 1803, as the genotype. He placed this genus in the family Galgulidae. Nethra nepaeformis (Fabricius), which was described in 1775 as Naucoris nepaeformis, was not included in this family until 1868. During 1843 and 1844, Guérin-Méneville proposed, as a subgenus of Mononyx, the name

---

* Harris, H. M., Pan Pacific Ent. Vol. 18, No. 4, pp. 161-162; shows that De Laportes paper did not appear in 1832 as usually given.

Peltopterus. He based this subgenus upon Naucoris rugosa Desjardins. He also described six new species. The genera Phintius, Matinus and Scylaecus were erected in 1861 by Stål for Mononyx grandicollis Germar, Mononyx alaticollis Stål and Galgulus macrothorax Montrouzier respectively. In addition, between 1854 and 1876, he described seven new species, four of which are now considered synonyms of previously described species. The genera Phintius and Scylaecus were also rightly placed in synonomy with Mononyx and Peltopterus by Montandon in 1899. The latter author was the first worker to present a detailed species key. It included seventeen species and was published in 1899 (Bulletin de la Societe des Sciences de Bucarest-Roumanie, An, VIII, No. 4 & 5, pp. 392-410). Furthermore, in 1900 (ibid, An. VIII, No. 6, pp. 1-9), he presented a key to five species of Matinus. This worker also described a dozen or more new species during the years 1895 to 1914. Finding that Galgulus Latrielle was preoccupied by Galgulus (Aves), Kirkaldy in 1897, gave the new name Gelastocoris to the genus. In the preparation of Biologia Centrali-Americana, Champion received from Montandon, a manuscript on Gelastocoris, which included among the species, two new ones. Although in his discussion Champion gives credit for these species to Montandon, the fact remains that he published while the latter author did not, so the new species must be considered as Champion's species.

More recently, in 1926, Blatchley described what he believed to be a new genus and species, Glossoaspis brunnea. Since the specimens on which this name was founded were from Florida, Blatchley apparently did not even consider that they might be the same as a species from the Eastern hemisphere. A recent comparison of a specimen of this species with the type of Peltopterus rugosa (Desjardin) by Doctor Eugene Seguy has shown that the two are identical. At the suggestion of Doctor H. B. Hungerford, Martin, 1929, made an exploratory survey of the genus Gelastocoris and was the first to use male genitalia for the identification of the species. He further discussed the value of the other characters for the identification of the species of Gelastocoris. In the paper he describes three new species, but he did not make a key to the genus. In the process of identification of specimens collected in northern South America, Douglas Melin (1929*), undertook a revision of the Gelastocoridae of the western hemisphere. The results of this work were: 1 new genus, Montandonius; 17 new species and 3 new subspecies. His keys, which are based entirely upon external characters, are fairly good and will permit the identification of a majority of the species. However, there are weak points which will lead to utter confusion, especially in the genus

---

* All sources list this date as 1930, however, Melin's paper was printed separately in December, 1928 and Dr. H. B. Hungerford has a copy which was mailed to him by the author on February 1, 1929.

Gelastocoris, the members of which are so extremely variable. He also does not accept the rule of priority as given by the International Committee on Zoological Nomenclature, but accepts as the author of the species, the first worker, whose description will permit the identification of a species. If this rule were followed, he would, himself, presently, be unable to claim authorship of a considerable number of the species which he described as new. For two new species of Mononyx, he gave the names bipunctatus and obscurus. Since both names had formerly been used in the genus, his names are homonyms and it has been necessary to rename these species.

In this study, characters which were used by earlier workers and a number of other characters were examined to determine their value in the identification of species of Gelastocoridae.

Color, which was used almost entirely in the descriptions of earlier workers, has been found to be too variable to be of much value. Also many specimens, especially in the Nerthrinae, are encrusted with mud and other debris so that the true color is not readily determined. This encrustation is difficult to remove, thus reducing the value of coloration. In a few species the color of certain structures may be characteristic. Such a case is seen in the white tubercles on the frons of Nerthra tuberculata (Montandon). It is the opinion of the writer that coloration should not be relied upon

alone and that other characters should be used whenever possible.

Size, alone, is not of specific value, except when used with other characters.

In the Nerthrinae, the tubercles of the head have been studied. The tubercles are variable to some extent, but are of value in separating the species into groups. Complete absence of these tubercles may be used and also the number and position of the tubercles may be of value. However, this character should not be relied upon alone, because these tubercles are rather variable within some species and may be nearly obsolete in species normally having prominent tubercles.

The apical margin of the head is more or less rounded and similar for most of the species of Gelastocoris, however, G. angulatus (Melin) usually has the apical margin slightly concave.

The antennae, while somewhat different in the two subfamilies, are not characteristic for a species. They are difficult to study and are nearly identical for all the species of each group.

In the past, the presence of ocelli has been one of the key characters in the separation of this family from the Naucoridae, however, I have found that six species lack ocelli. These six species belong to three rather distantly related groups of the Nerthrinae and undoubtedly ocelli have been lost independently. Although the absence

of ocelli does not show a phylogenetic relationship, the presence or absence of ocelli is useful in the separation of groups of species.

The shape of the pronotum, especially of the lateral margin, although slightly variable, seems to be constant for most species. In some species, on the other hand, the degree of variation is quite great and some specimens even show a remarkable difference in the two sides. Also the general shape for many species, within both subfamilies, is more or less similar. One species, G. angulatus (Melin), has 6 to 8 distinct, short, longitudinal carinae on the posterior portion of the pronotum. These carinae are lacking in the other species of this genus.

The scutellum, while it differs some between the two subfamilies and to some extent in some of the species of each, is not considered to be of much value in determination of species. In what was formerly the subgenus Peltopterus, the scutellum is somewhat smaller than in the other Nerthrinae, but as reduction in size of scutellum follows loss of normal flight wings, this is not considered important and certainly the difference is not sufficient for generic or subgeneric consideration. Furthermore, most specimens are pinned through the scutellum, which makes it difficult to study this structure.

The hemelytra may vary in length for the different species and may be of some value. Reduction of the membrane occurs in both subfamilies and in the Nerthrinae

the hemelytra may be entirely coriaceous and separate or fused together. These characters are of value in the identification of species, but as with the absence of ocelli, have arisen independently and do not imply a close phylogenetic relationship. The embolium exhibits characters that are specific. A few species show a strongly dilated lateral margin. This is considered as a generic characteristic by Melin. The shape of the lateral margin of the embolium of the other species is of some value when used with other characters.

Bristles found on different parts of the insects, especially in Nerthrinae, may prove to be of value upon further investigation. This writer has used bristles, along with other characters, to identify several species. The bristles tend to form groups on the tubercles of the scutellum and upon the hemelytra and they vary in both size and shape for a given species. Also, they are too frequently covered by the encrustation or are rubbed off to be a character of positive identification in most species.

In the genus Gelastocoris, some of the granulations, especially upon the hemelytra, may be enlarged and blister-like or more elevated and peg-like. Both may be used with other characters in the identification of species. The blister-like granules are somewhat variable in number and size within a species, but can be used to help separate a few species.

The legs of Gelastocoris are all more or less the same for the different species. In a few species, the legs, especially the hind pair, are a little longer in proportion to the length of the body, but the difference was not great enough to be used. The size and shape of the anterior dilation of the front femora will separate two species in the Nerthrinae from the other species, but the femora of the others are so similar as to be of no value. The trochanters were studied and in particular small tubercles on the apices were examined, but these were found to be too variable within a species to be of value. Proportions of the intermediate and hind legs were checked and results showed them to be more or less the same for all species. Spines on the legs are not characteristic of a species.

The mesosternal elevation was used by Montandon in identification of some of the species of Nerthrinae from the Eastern hemisphere. This structure is fairly variable within a species and in the opinion of the writer should only be used with other characters, if at all, and only when there is no possibility of confusion with another species, i. e. N. grandicollis (Germar). It is difficult to study because it is so often covered by the fore and intermediate legs and commonly destroyed by the insect pin passing through or close to it.

The shape and size of the abdominal segments of the

male are constant for a species and of specific value in some cases. In the Nerthrinae, the seventh ventral abdominal segment of the females from the western hemisphere, Asia and Africa have the posterior margin deeply emarginate and possess elevations and depressions or both, which are characteristic for the species. The females from the Australian region and Pacific Islands have the seventh ventral abdominal segment more or less projecting posteriorly and covering the anal flaps. The latter vary in shape and size and are of some value when used with other characters.

The male genitalia were examined and found to be very characteristic for a species. They should be used as a final check, when males are available to the worker. The female ovipositors were examined and the pattern and number of spines studied, but these were too variable in a species to be of value.

Various proportions of different parts of the insects were compared and with a few exceptions were practically the same for most of the species in each of the two subfamilies.

PHYLOGENY

Because of the habitat and the structure of the body, the family Gelastocoridae has usually been considered as representing an intermediate group in the progression from a terrestrial to an aquatic mode of life.

Whether this family represents an independent line of development toward the semi-aquatic mode of life or whether they have arisen from a common ancestor with existant aquatic forms, i. e. Naucoridae, is not clear. Morphological evidence, however, seems to point to the latter. The morphological similarity between the subfamily Nerthrinae and the Naucoridae is, in many respects, very great. In fact, in the opinion of the writer, the members of this subfamily are almost as close to the Naucoridae as they are to the Gelastocorinae. If the two families had a common ancestor, an interesting question arises as to the type of antennae possessed by this form. If we assume that the ancestral form had exposed antennae, then there are two possible explanations for the cryptocerous condition. First, it may be suggested that this condition arose independently in the two groups, due to the burrowing habit in the case of the Gelastocoridae or as an adaptation to the aquatic medium in the case of the Naucoridae and other aquatics. Secondly there is the possibility that the Gelastocoridae could represent a group which has left the water and is in the process of leaving the semi-aquatic habitat. In this event we would consider the Naucoridae as the ancestral family. A more plausible explanation might be that all the aquatics, with the Naucorids as the most primitive, have arisen from a primitive Gelastocorid type ancestor which already had developed hidden antennae

as a result of burrowing. While fossils of Naucorids, Notonectids, etc., have been found as far back as Triassic and Jurassic times, the author has not found any record in the literature concerning fossil Gelastocoridae. This may be partially due to the fact that many of the fossils of aquatic insects were from European deposits. Gelastocorids do not occur in Europe at the present time, and further, it is not impossible to believe that they never have occurred there. It seems most peculiar that there have not been numerous fossils of this family, since they live in habitats which would seem to be most favorable to fossilization. The two subfamilies of Gelastocoridae, without a doubt, had a common ancestor, and the separation into two branches is apparently very ancient, the Gelastocorinae being the more primitive in the opinion of this writer. Since the Gelastocorinae are at present known only from the Western hemisphere, we must assume either that they originated here or that they once had a more widespread distribution. The latter, of course, can only be proved by fossil evidence. If the first assumption is correct and the Gelastocorinae are the most primitive, then the Nerthrinae must also have originated in the Western hemisphere. If this is true, then the spread of the species could have been by means of Alaska into Asia and then to Australia and to Africa. If, on the other hand, Gelastocoris had a more widespread distribution in the past, then the spread of Nerthrinae could have been in

the reverse direction with the African species N. grandicollis (Germar) representing a relict species. This seems to agree with Darlington's theory (4) that the cold-blooded vertebrates originated in the Old World tropics and spread from there to the Western hemisphere and to Australia. These are of course, entirely different animals, but it is interesting to note that they occupy, in general, more or less the same type of habitat. The species of India and Africa exhibit characteristics in common with both the Australian species and with the American species, which could be used as evidence for either direction of distributional spread. It may be that future biological and morphological studies will help solve this problem.

TECHNIQUES

In order to facilitate the use of the keys and the descriptions contained in this work, it is necessary at this time to discuss the techniques of measurements, dissections, etc.

In the measurement of the length of the specimens, the distance from the anterior margin of the eyes to the posterior end of the abdomen or to the apices of the hemelytra, whichever was the greater, was used. In the measurement of the width of specimens, both the greatest width of the pronotum and the width of the abdomen at a level with the apex of the scutellum were recorded. In

the males of Nerthrinae, the distance between the caudo-lateral angles of the sixth ventral abdominal segment was compared with one-half the width of the posterior margin of the fourth ventral abdominal segment. The right side of the fourth segment is used and the distance is measured from the median notch along the posterior margin to the caudo-lateral angle of this segment. For all other measurements the greatest width or length was used, unless otherwise atated.

The technique for extracting the male genitalia is as follows: The male is determined by the structure of the ventral abdominal segments, the labels may then be pushed down to about one-fourth of an inch from the point of the pin and the specimen then immersed in 5% alcohol with the labels resting on the outside of the lip of the relaxing dish, holding the specimen in place. In this manner a fairly large number of specimens may be relaxed at a time, the number depending upon the speed at which the worker can extract the genitalia. The length of time required for relaxation will vary with the size, the age of the specimens and to some degree, the extent to which the specimens are covered by encrustations. Approximately 15 to 20 minutes is sufficient for Gelastocoris, while Nerthra, especially the larger species require a longer period. The process can be speeded by using a warm relaxing fluid, but the writer has found that the number of specimens that could be handled at one time

must be reduced or the specimens may become too relaxed. This makes extraction of the genitalia more difficult in that the last few segments may tear off in the attempt to remove the genital capsule, unless extreme care is taken in the dissection. A special relaxing fluid (Alcohol 75%, 106 cc.; Distilled water, 98 cc.; Benzol, 14 cc.; Ethyl acetate, 38 cc.) may be used in place of 5% alcohol. When the specimen is sufficiently relaxed, that is to say, when it is relaxed enough to prevent breakage yet stiff enough so that the abdominal segments may be moved only by applying considerable pressure, the genitalia may be extracted. From this point the technique varies according to the subfamily being studied. For the Gelastocorinae, the procedure is as follows: Holding the specimen in one hand between the thumb and one finger, insert a small dissecting needle a short distance into the left side of the aperture of the posterior end of the abdomen. Then pushing to the right with the point of the dissecting needle and pulling the needle out at the same time the genital capsule will be extracted. The genitalia may then be turned a quarter of a turn counterclockwise, in this position the genitalia will "lock" against the membrane of the hemelytra and will be exposed at the end of the abdomen, where they are available for study at any time. Occasionally, in old specimens or in specimens which are not completely relaxed, the membranes and the muscles which hold the

genital capsule to the preceding segment may break causing the genitalia to become completely separated from the specimen. In such cases, the genital capsule may be placed in a small vial (4 X 10 mm.) in a small amount of glycerin. These vials may be kept with the specimen by running the pin through the cork. When such a procedure is used, it is advisable to run the pin through the cork at a slant and also to use as little glycerin as is necessary to cover the genital capsule. The procedure for the extraction of the genitalia of the Nerthrinae is as follows: If the entire right clasper is to be studied it is necessary to remove the last two abdominal segments. This portion of the insect is then placed in a drop of glycerin on a slide, where the clasper is removed by breaking the segments longitudinally, and cutting the strong muscles at the base of the clasper. It is unfortunate that it is necessary to destroy these segments, but no other manner could be found for removing the entire clasper. An effort was made to remove the clasper from the specimen without removal of the eighth abdominal segment. It was found, however, that the ninth segment could not be removed separately in most species and that the danger of breaking the clasper was great when such a procedure was attempted. A better procedure and one completely satisfactory for identification is as follows: After relaxation, with a dissecting needle gently pull the segments to the rear and to the left of the insect until the

clasper is clear of the abdomen. Then allow the segments to pull back to their normal position, but direct the clasper with the needle to the ventral side of the abdomen. It will remain in this position and can be studied readily by simply inverting the specimen.

All the drawings of the complete right claspers of the Nerthrinae were made so that the worker will see the ventral surface of the clasper. In this manner comparison may be made with the drawing when the latter method of extracting the clasper is used. In order to make such a comparison, the specimen should be tilted slightly so that the last two segments will be horizontal, thus assuring a true ventral view of the clasper. In emphasizing the value of the second procedure of extraction of the claspers of Nerthrinae, it may be pointed out that the most distinctive part of the clasper in almost all species is the apical half, which ordinarily is fully visible when this procedure is used.

As has been mentioned previously, many specimens, especially in the Nerthrinae, may be covered with an encrustation of mud or other debris. It often becomes necessary therefore, to remove this encrustation, in order to study certain structures. In the past this has been a difficult task, which required much brushing of completely relaxed specimens. Recently, Nelson (15) has discovered a new method of removing the encrustations from specimens of the family Elmidae (Coleoptera). This method may also

be used for the Gelastocoridae. For insects collected dry or in alcohol, or those which have been pinned in the uncleaned condition, the procedure is as follows: Place the specimen in 5 to 10% acetic acid for 20 to 30 minutes. Then put the specimen in a dish of warm tap water, a Syracuse dish is satisfactory for small species, then add a pinch of tri-sodium-phosphate, known commercially as "T. S. P.". The length of time the specimen is left in this solution varies with the degree of encrustation. When the encrustation has become loosened, it is removed from the specimen by means of a brush with short stiff bristles. Such a brush can be made by taking a small inexpensive paint brush and cutting the bristles down to a length of about 1 mm. and then bending the metal tip inwardly to crowd the bristles together and thus making the brush stiffer. When collecting specimens, if they are placed in Pampel's Fluid, they may be cleaned amazingly well when subjected to 20 or 30 minutes in T. S. P. Pampel's Fluid is composed of the following materials: Distilled water, 30 parts; 95% Ethyl alcohol, 15 parts; Glacial acetic acid, 4 parts; Formaldehyde (40%), 6 parts.

FAMILY CHARACTERISTICS

Squat, medium sized bugs, head triangular in front view, fitting into concavity between the anterior angles of the pronotum. Rostrum four-segmented. Eyes large, reniform and projecting dorso-laterad. Ocelli usually

present. Antennae short, four-segmented, inserted beneath the eyes and hidden between the head and prothorax. Pronotum large, much wider than the head, disk elevated. Scutellum, usually rather large, triangular and elevated. Hemelytra with clavus, corium, embolium and membrane, or with membrane reduced or entirely lacking and in a few species with the hemelytra united. Anterior legs raptorial. Abdominal segments of the male more or less asymmetrical. The nymphs of the species of the entire family possess ocelli as far as is known. This family may be separated from the Ochteridae and Saldidae by the hidden antennae and from the Naucoridae by presence of ocelli in most cases and by the fact that the head is not flattened dorso-ventrally.

KEY TO THE SUBFAMILIES AND GENERA
OF GELASTOCORIDAE

A. Fore tarsus not fused to tibia, articulate; two well-developed tarsal claws on foreleg in adult; rostrum arising from apex of head, stout, recurved posteriorly....(Gelastocorinae) Gelastocoris Kirkaldy.

AA. Fore tarsus fused to tibia, not articulate; one well-developed tarsal claw on foreleg in adult; rostrum appearing to arise on ventral surface of head, slender, projecting anteriorly or ventrally (Nerthrinae) Nerthra Say.

GELASTOCORINAE Champion.

Gelastocorids with the rostrum arising from apex of head, stout, recurved posteriorly. Anterior leg with a single, articulate, tarsal segment which bears two well-developed tarsal claws. Ninth ventral abdominal segment of the male completely invaginated within the body cavity, not visible externally, the posterior process (keel) and right clasper greatly modified, the two structures guiding the simple, tubular aedeagus, left clasper small, simple. Ventral abdominal segments of female nearly symmetrical.

The Genus Gelastocoris Kirkaldy

1897. Kirkaldy, G. W., Entomologist, Vol. XXX, p. 258. (n. n. for Galgulus Latr.)

1901. Champion, G. C., Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 347.

1906. Kirkaldy, G. W., Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

1909. Kirkaldy, G. W. and Torre-Bueno, J. R. de la. Proc. Ent. Soc. Washington, Vol. X, p. 180.

1917. Van Duzee, E. P., Catalogue of Hemiptera, Univ. California Publ., p. 472.

1919. Hungerford, H. B., Univ. Kansas Sci. Bull., Vol. XI, p. 46.

1929. Melin, D., Zoologiska Bidrag Fran Uppsala, Band 12, pp. 153-154.

1929. Martin, C. H., Univ. Kansas Sci. Bull., Vol. XVIII, p. 352.

References to this genus under Galgulus Latreille.

1802. Latreille, P. A., Histoire naturelle, générale et particulière des Crustacés et des Insectes, Vol. III, p. 253. (oculata only species).

1804. Latreille, P. A., Histoire naturelle, générale et particulière des Crustacés et des Insectes, Vol. XII, p. 286.

1807. Latreille, P. A., Genera Crustaceorum et Insectorum, etc., Vol. III, p. 143.

1810. Latreille, P. A., Considérations générales sur l'ordre naturel des animaux, etc., pp. 260, 434.

1815. Leach, W. E., Brewster's Edinburgh Encyclopédia, Vol. IX, p. 123.

1816. Lamarck, C. de, Histoire naturelle des animaux sans vertèbres, Vol. III, p. 509.

1825. Latreille, P. A., Familles Naturelles du Règne Animal, pp. 424-425.

1825. Le Peletier, A. L. M. and Serville, A., Encyclopédie Méthodique, Vol. X, p. 270.

1833. Laporte, F. L. de, Essai d'une Classification Systématique de L'order des Hémiptères, pp. 15-16.

1835. Burmeister, H. C. C., Handbuch der Entomologie, Band 2, Abteil. 1, p. 201.

1835. Brullé, G. A., Histoire Naturelle des Insectes, Vol. IX, p. 274.

1837. Spinola, M. M., Essai sur les Insects Hémiptères, etc., p. 62.

1839. Herrich-Schäffer, G. A. W., Die Wanzenartigen Insecten, Vol. V, p. 87.

1840. Blanchard, E., Histoire Naturelle des Animaux Articules, Bd. 3, p. 93.

1843. Amyot, C. J. B. and Serville, A., Histoire Naturelle des Insectes. Hémiptères, p. 424.

1850. Spinola, M. M., Tavola Sinottica, etc., 25, 1, p. 49.

1851. Fieber, F. X., Genera Hydrocoridum (from Abhandlungen der König. Bohmischen Gesellschaft der Wissenschaften in Prague), p. 13.

1853. Herrich-Schäffer, G. A. W., Die Wanzenartigen Insecten, Vol. IX, pp. 19, 24.

1873. Walker, F., Catalogue of Hemiptera in British Museum, Part VIII, p. 170.

1876. Stål, C., Kongliga Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1879. Berg, C., Hemiptera Argentina enumeravit speciesque novas descripsit., p. 185.

1884. Uhler, P. R., Standard Natural History, Vol. II, p. 263.

Small to medium sized bugs, extremely variable in color, but usually more or less variegated. Rostrum arising from apex of head, stout, recurved posteriorly. Anterior leg with a single, articulate, tarsal segment which bears two well-developed tarsal claws. Ocelli present, though rather small in some species. Ninth ventral abdominal segment of the male completely invaginated within the body cavity, not visible externally, the posterior process (keel) and right clasper greatly modified, left clasper small, simple. Ventral abdominal segments of female nearly symmetrical, occasionally with the incision of the posterior margin of the last segment bent to the left of the specimen.

KEY TO THE SPECIES OF GELASTOCORIS*

1. Basal portion of pronotun with 6 to 8 longitudinal carinae.....G. angulatus (Melin) (p. 97)

   Basal portion of pronotum lacking carinae.....2

2. (1) Lateral margin of pronotum straight or nearly so..3

   Lateral margin of pronotum notched.....4

3. (2) Lateral angle of pronotum projecting beyond base of embolium, not bent ventrad, connexivum quite visible.....G. bufo (Herrich-Schäffer) (p. 71)

   Lateral margin of pronotum not or scarcely projecting beyond base of embolium, bent ventrad, connexivum completely covered or nearly so by hemelytra.....G. rotundatus Champion (p. 56)

4. (2) Membrane of hemelytron reduced, its length subequal to or less than the width of hind femur.....5

   Membrane of hemelytron well-developed, its length usually about twice or more the width of the hind femur.....8

5. (4) Pan of male genitalia bilobed.....G. andinus Melin (p. 78)

   Pan of male genitalia not bilobed.....6

6. (5) Pan wider than long, more or less rounded.....7

   Pan not wider than long, rather elongate..... .....G. peruensis Melin (p. 80)

7. (6) Tumescence of right clasper adnate to base of clasper; keel hook very long and recurved, extending completely back across base of pan..... .....G. flavus (Guérin-Méneville) (p. 85)

   Tumescence of right clasper not adnate to base of clasper; keel hook not recurved back over pan.....G. viridis n. sp. (p. 94)

* Does not include Gelastocoris apureensis Melin. (see p. 101)

8. (4) Tumescence of right clasper adnate to base of clasper; keel hook recurved completely back over base of pan.....G. flavus (Guérin-Méneville) (p. 85)

Tumescence of right clasper not adnate to base of clasper, keel hook not recurved completely back over base of pan.....9

9. (8) Pan of male genitalia very thin, elongate, narrow and twisted apically, turned completely over.....G. amazonensis Melin (p. 75)

Pan of male genitalia not as above, usually thick, when thin, not elongate or twisted completely over.....10

10. (9) Keel hood located to the left side of the keel.....G. fuscus Martin (p. 91)

Keel hood, not as above, located either to the right side of the keel or covering the entire apex.....11

11. (10) Fringe of keel hood nearly transverse, simply concave; secondary keel hood not prominent.....12

Fringe of keel hood bent toward apex at middle, then obliquely concave to left margin of apex of keel; secondary keel hood prominent.....G. hungerfordi Melin (p. 61)

12. (11) Pan rather flattened, wider than long, in an oblique plane in relation to the horizontal plane of the genital capsule.....G. vicinus Champion (p. 66)

Pan more or less thickened, elongate, not in a distinct oblique plane in relation to the horizontal plane of the genital capsule.....13

13. (12) Posterior portion of lateral margin of pronotum usually extending more or less posterolaterad to lateral angle; color quite variable .....G. oculatus oculatus (Fabricius) (p. 30)

Posterior portion of lateral margin of pronotum transverse or nearly so; white coloration more abundant.....G. oculatus variegatus (Guérin-Méneville) (p. 51)

Gelastocoris oculatus oculatus (Fabricius)

(Pl. I, figs. 1, 2; Pl. III, figs. 1, 4; Pl. IV, fig. 1; Pl. V, figs. 9, 11)

1798. Naucoris oculata Fabricius, Supplementum Entomologiae Systematicae, p. 525.

1802. Galgulus oculatus (Fabricius); Latreille, Histoire naturelle générale et particulière des Crustacés et des Insects, etc., III, p. 254.

1803. Naucoris oculatus Fabricius; Fabricius, Systema Rhyngotorum, p. 111.

1804. Galgulus oculatus (Fabricius); Latreille, Histoire naturelle générale et particulière des Crustacés et des Insects, etc., XII, p. 287.

1815. G. oculatus (Fabricius); Leach, Brewster's Edinburgh Encyclopedia, IX, p. 123.

1825. G. oculatus (Fabricius); Le Peletier and Serville, Encyclopédie Méthodique, Vol. X, p. 270.

1835. G. oculatus (Fabricius); Burmeister, Handbuch der Entomologie, Band 2, Abteil. 1, p. 202.

1843. G. oculatus (Fabricius); Amyot and Serville, Histoire Naturelle des Insectes. Hémiptères, p. 425.

1868. G. oculatus (Fabricius); Stål, Hemiptera Fabriciana, I, p. 133.

1873. G. oculatus (Fabricius); Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 170.

1876. G. oculatus (Fabricius); Uhler, Bull. U. S. Geol. Surv., Vol. I, No. 5, p. 336, Pl. XXI, fig. 34.

1876. G. oculatus (Fabricius); Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1878. G. oculatus (Fabricius); Uhler, Wheeler's Rept. to Chief Engineer for 1877, p. 1331.

1878. G. oculatus (Fabricius); Uhler, Proc. Boston Soc. Nat. Hist., Vol. XIX, p. 440.

1884. G. oculatus (Fabricius); Uhler, Standard Natural History, Vol. II, p. 263.

1886. G. oculatus (Fabricius); Uhler, Bull. Brooklyn Ent. Soc., p. 27.

1891. G. oculatus (Fabricius); Summers, Bull. Agric. Exp. Sta., Univ. Tennessee, Vol. IV, No. 3, p. 84.

1893. G. oculatus (Fabricius); Osborn, Proc. Iowa Acad. Sci., Vol. I, Part IV, p. 123.

1894. G. oculatus (Fabricius); Uhler, Proc. California Acad. Sci., Ser. 2, Vol. IV, p. 290.

1895. G. oculatus (Fabricius); Pittier and Biolley, Inst. fisico geografico Nacional (Costa Rica), p. 23.

1895. G. oculatus (Fabricius); Gillette and Baker, Colorado Agric. Exp. Station Bull., No. 31, Ser. 1, p. 62.

1897. Gelastocoris oculatus (Fabricius); Kirkaldy, Entomologist, XXX, p. 258. (n. n. for Galgulus Latreille).

1901. G. oculatus (Fabricius); Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 348.

1905. G. oculatus (Fabricius); Torre-Bueno, Jour. New York Ent. Soc., Vol. XIII, p. 43.

1906. G. oculatus (Fabricius); Kirkaldy, Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

1907. G. oculatus (Fabricius); Torre-Bueno and Brimley, Ent. News, Vol. XVIII, p. 433.

1909. G. oculatus (Fabricius); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1914. G. oculatus (Fabricius); Barber, Bull. Am. Mus. Nat. Hist., Vol. XXXIII, p. 498.

1917. G. oculatus (Fabricius); Van Duzee, Catalogue of Hemiptera, Univ. California Publ., pp. 472-473.

1919. G. oculatus (Fabricius); Hungerford, Univ. Kansas Sci. Bull., Vol. XI, pp. 46-51, Pls. III, V, IX.

1922. G. oculatus (Fabricius); Hungerford, Univ. Kansas Sci. Bull., Vol. XIV, pp. 145-171, Pls. XIII, XIV.

1926. G. oculatus (Fabricius); Torre-Bueno, Bull. Brooklyn Ent. Soc., Vol. 21, No. 5, pp. 190-191.

1926. G. oculatus (Fabricius); Payne, Jour. Morphology and Physiology, Vol. 43, No. 2, pp. 299-345, 8 pls.

1929. G. oculatus (Fabricius); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 164-167, figs. 6, 8, 9, 23-25.

1929. G. oculatus (Fabricius); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, pp. 357-360, Pl. 58, figs. 9, 10, 11, 12, 13; Pl. 59, figs. 1-3, 18, 19c and 20.

1938. G. oculatus (Fabricius); Johnson, Jour. Morph., Vol. 62, No. 1, pp. 113-134, 2 pls.

1942. G. oculatus (Fabricius); Kevan, Proc. Royal Ent. Soc., London, (a) 17, pts. 10-12, pp. 109-110.

Also referring to this species:

1923. Gelastocoris barberi Torre-Bueno, Connecticut Nat. Hist. Surv. Bull., No. 34, p. 393, fig. 38.

1926. Gelastocoris subsimilis Blatchley, Heteroptera of Eastern North America, p. 1025.

1929. Gelastocoris californiensis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 167, fig. 26.

Size. Male: Length, 6.1 to 8.0 mm.; width of pronotum, 4.0 to 5.3 mm.; width of abdomen, 3.9 to 5.2 mm. Female: Length, 6.7 to 9.3 mm.; width of pronotum, 4.3 to 5.9 mm.; width of abdomen, 4.4 to 6.0 mm.

Color. Extremely variable both as to color and pattern. Colors present are black, brown, red, orange, yellow, white and green. Legs are ringed with brown. It would be an endless and useless task to try to describe all of the combinations of colors and patterns. In general, the specimens from the southeastern United States are smaller and darker, while those from the rest of the United States tend to be larger and lighter, but both extremely dark and extremely

light forms as well as all intermediates may be found in either area.

Structural Characteristics. Apex of head rounded or weakly pointed; front moderately rough, provided with low, broad elevations which vary in size with the specimen; ocelli rather small, equal to or slightly larger than the blister-like granules of the hemelytra. Pronotum with the disc moderately rough, though the degree of roughness varies with the specimen; lateral margin quite variable, usually with anterior portion subparallel for a distance equal to two-thirds the length of the ocellocular space, slightly divergent, then lateral margin extending diagonally postero-laterad to the lateral angle, in some specimens this portion of the lateral margin may be nearly transversal, usually this portion of the lateral margin is convex, more rounded toward the lateral angle, lateral margin weakly serrate; postero-lateral margin extending diagonally postero-mesad to base of embolium, serrate; lateral angle projecting laterad beyond the base of embolium; width of pronotum subequal to width of abdomen; base of pronotum lacking short, longitudinal carinae. Hemelytra extending beyond the end of abdomen; membrane well-developed; basal half of lateral margin of embolium expanded, width of expansion about three times as wide as largest blisterlike granule, expansion forming an obtuse angle posteriorly. Connexivum prominent. The blister-like granules few in number, slightly less in width than base of hand tarsus. Spatulate right side of seventh ventral abdominal segment of male

about half covered by the preceding segment, not extending to the lateral margin of the abdomen; left side projecting posteriorly only slightly. Female ventral abdominal segments nearly symmetrical, the incision may be symmetrical or bent to the left. Keel hood of male genitalia broadly triangular, apex blunt, an oval concavity near apex on the ventral surface, fringe nearly transversal, somewhat concave in center; keel hook present, rather stout, recurved and apex extending partially over pan; pan with apex thick, but narrow, about one-half width of base, with a slight depression on ventral surface, base more flattened, pan as whole in plane at right angle to the dorso-ventral axis of the insect; right clasper hook quite variable, usually apical half digidiform, usually rather thin, transversal portion of base variable as to thickness, there may be a lateral projection present at the base of digidiform process, this also is variable in size; tumescence of right clasper not adnate to basal portion of clasper; antero-lateral projection of keel absent.

Location of Type. In the Kiel Museum, Kiel, Germany. This museum was destroyed during the recent war, but the Fabrician Collection was removed and saved. Doctor H. B. Hungerford visited the museum in 1928, and he reports that the type has been partially destroyed by dermestids and that only the hemelytra and scutellum remain. The type is labeled "Carolina."

Distributional Data. This species has been reported from the United States to Brazil by various workers, but

this worker has seen only three specimens from outside the limits of the United States, one from northern Mexico, the other two from Ontario. Since many of the species in this group are very similar in external appearance, it seems likely that reports of G. oculatus (Fabricius) from Central and South America are probably misidentifications. The writer has studied approximately 1500 specimens or more from the following localities:

Alabama: Burnsville, July 20, 1930, R. H. Beamer, 1 female; Coatopa, July 18, 1930, P. W. Oman, 1 male; same place and date, R. H. Beamer, 2 females; Decatur, July 6, 1939, J. D. Beamer, 1 male and 1 female; Marion Jct., July 16, 1930, P. W. Oman, 2 males and 2 females; Mt. Meigs, July 21, 1930, R. H. Beamer, 1 female; same place & date, L. D. Tuthill, 1 male and 1 female; Tuskegee, July 22, 1930, P. W. Oman, 1 male and 1 female.

Arizona: Bill Williams Fork, Aug., F. H. Snow, 6 males and 8 females; Box Canyon, May 9, 1938, F. Parker, 1 male; Chiricahua Mts., Sept. 16, 1935, F. H. Parker, 1 female; Clifton, July 14, 1933, F. Parker, 2 males; Coconino Co., July 1, 1929, L. D. Anderson, 1 female; Congress Jct., July, F. H. Snow, 1 female; Douglas, Aug., F. H. Snow, 1 female; Fort Yuma, Aug. 4, Hubbard, 1 female; Grand Canyon, Aug. 11, 1927, L. A. Anderson, 2 males and 1 female; Humphrey's Peak, Aug., F. H. Snow, 1 female;

Maricopa Co., July 1, 1929, L. A. Anderson, 1 female; same place & date, R. H. Beamer, 1 female; Oak Creek Canon, Aug., F. H. Snow, 1 female; same place, July 9, 1941, B. Hodgden, 5 males and 4 females; Prescott, 1 male and 4 females; Sabina Canyon, Sta. Catalina Mts., July 24, 1940, 2 males; same place, July 23, 1917, P. A. Munz, 1 male and 1 female; Sierra Ancha, July 19, 1927, 1 female; Tuscon, F. H. Snow, 28 males and 58 females; Southern Arizona, 2 females.

Arkansas: Fayetteville, Apr. 20, 1895, 1 male and 1 female; same place, Aug. 1923, 2 females; same place, Apr. 22, 1930, H. H. Schwardt, 1 male; same place. Apr. 23, H. H. Schwardt, 1 male and 1 female; Lawrence Co., nr. Imboden, June, 1925, B. C. Marshall, 1 male and 1 female (USNM); Ark., 1 male.

California. Alma, Santa Cruz. Mts., Apr. 22, 1931, C. H. Martin, 1 female; Bakersfield, July 14, 1929, P. W. Oman, 2 females; same place, July 24, 1929, R. H. Beamer, 2 males and 1 female; Barrett, Cottonwood Creek, Apr. 13, 1930, C. H. Martin, 2 males and 2 females; Bautista Canyon, July 5, 1931, C. H. Martin, 1 female; Berkeley, April 26, 1933, Jean Linsdale, 1 male and 1 female; Cajon Pass, Aug. 6, 1936, R. H. Beamer, 1 female; Calexico, Aug. 1, 1931, H. W. Capps, 1 female; Claremont, 1916, M. H. Hatch, 2 males and 1 female; Cypress Rdg., Marin Co.,

March 29, 1921, C. T. Dodds, 1 female; Dulzura, Aug. 9, 1935, J. Beamer, 1 male and 2 females; Indio, July 24, 1929, P. W. Oman, 1 female; Lake Tahoe, Aug. 11, 1940, L. C. Kuitert, 2 males and 3 females; Los Angeles, W. T. Davis, 1 female; Los Angeles River, Oct. 24, 1915, 1 male; same place, Aug. 15, 1916, V. Duran, 1 female; Los Gatos Cr., Sept. 24, 1910, 1 female; Los Penasquitos Creek, Poway V., Apr. 10, 1930, C. H. Martin, 1 male and 4 females; same place, Apr. 11, 1930, C. H. Martin, 1 male; Lucerne, July 17, 1935, R. H. Beamer, 1 male; Marin Co., Aug. 3, 1929, L. D. Anderson, 2 males and 2 females; same place, no date or collector, 1 female; Mount Shasta, no date or collector, 1 male and 2 females; Palo Alto, Apr. 13, 1893, no collector, 1 female; same place, Apr. 24, 1893, no collector, 1 female; same place, Apr. 27, 1893, no collector, 2 males and 1 female; Pasadena, no date or collector, 1 male and 4 females; Pine Valley, July 27, 1938, R. I. Sailer, 1 male; Rio Hondo, Los Angeles Co., Mar. 21, 1930, C. H. Martin, 1 female; same place, Mar. 23, 1930, C. H. Martin, 1 male and 1 female; same place, Mar. 30, 1930, C. H. Martin, 1 male and 2 females; Rosamond, July 23, 1940, L. C. Kuitert, 1 male and 3 females; Salinas River, San Ardo, Apr. 25, 1930, C. H. Martin, 1 male and 1 female; San Diego, no date, Drake, 1 male;

San Diego Co., Lake Hodges, Aug. 5, 1937, F. W. Furry, 1 female; San Gabriel River, March, 1930, C. H. Martin, 1 male and 1 female; San Jacinto Mts., July 21, 1929, R. H. Beamer, 1 female; same place and date, P. W. Oman, 1 male; San Luis Rey River, Apr. 15, 1930, C. H. Martin, 1 male and 2 females; San Mateo Creek, May 8, 1930, C. H. Martin, 1 male; San Mateo Co., no date, Heidemann, 1 female; San Pablo, Alameda Co., Apr. 30, 1921, C. T. Dodds, 2 males; S. Pablo Val., May 9, 1921, C. T. Dodds, 1 male and 1 female; Santa Ana Canyon, June 8, 1930, D. W. Martin, 2 males and 1 female; Santa Margarita Creek, May 8, 1930, C. H. Martin, 1 male and 1 female; Santa Margarita River, Apr. 8, 1930, C. H. Martin, 3 females; Santa Monica, Mar. 26, 1879, 1 male (Milw. Mus.); Sonoma Co., no date or collector, 1 male and 1 female; Stanford U., Sept. 12, 1909, no collector, 1 male; same place, Oct. 9, 1909, no collector, 1 male and 1 female; same place, Nov. 1910, no collector, 1 male; Sunol, May 8, 1921, C. T. Dodds, 1 male and 1 female; Sweetwater River, Descanso Jct., Apr. 13, 1930, C. H. Martin, 2 males and 1 female; Sweetwater River, San Diego Co., no date, W. J. Chamberlin, 2 males (Mich. Coll.); Warm Spring Creek, Temecula, April 18, 1930, C. H. Martin, 1 male and 1 female; Warner Sprgs., July 28, 1938, R. I. Sailer, 1 male and 1 female; Winters, Aug. 6, 1929, R. H. Beamer, 5 males and 7 females; same place and date, P. W. Oman, 2 males and 1 female; Vina, May 15, 1921, C. T. Dodds,

2 males; California, no date or collector, 1 female; Tehama Co., Redbluff, Aug. 28, 1926, C. L. Hubbs, 1 female.

Colorado: Colorado Springs, Aug., E. S. Tucker, 1 female; Fort Collins, Aug. 12, 1931, M. W. Sanderson, 1 male and 2 females; same place, July 16, 1900, no collector, 2 males.

District of Columbia; Brightwood, Apr. 30, 1901, Heidemann, 1 male; same place, May 20, Heidemann, 1 male; Rock Creek, June 17, 1893, Heidemann, 1 female; same place, July 8, 1893, Heidemann, 1 male; same place, June 19, 1902, Heidemann, 1 female; Washington, June 1893, Heidemann, 1 female; same place, Mar. 2, 1894, Heidemann, 1 male; same place, June 8, 1894, Heidemann, 1 male; same place, June 29, Heidemann, 1 male; same place, July 8, Heidemann, 2 females.

Florida: Biscayne, May 24, 1887, Heidemann, 1 male; Branford, July 31, 1930, R. H. Beamer, 1 male and 1 female; Chokolookee, no date or collector, 1 male; Crescent City, Apr. 1908, Van Duzee, 1 male and 1 female; Farmdale, June 27, 1948, E. L. Todd, 4 males and 4 females; Floral City, July 7, 1948, E. L. Todd, 8 males and 6 females; Ft. Pierce, Aug. 7, 1930, R. H. Beamer, 1 male and 1 female; Fort Walton, June 27, 1948, E. L. Todd, 1 female; Gulf Port, no date, A. G. Reynolds, 6 males and 2 females; Hilliard, Aug. 31, 1930, R. H. Beamer, 1 male and 1 female; Ind. River, no date or collector, 1 female (Milw. Mus.); Inglis, July 7, 1948, E. L. Todd, 6 males and 3 females; Labelle, Apr. 19, D. M. DeLong, 1 male; same place, July 16, 1938, R. H. Beamer, 2 females; same place, July 19, 1948, B. T. McDermott, 10 males and 8 females; same place and date, H. W. Crowder, 1 male and 1 female; same place and date, E. L.

Todd, 54 males and 43 females; same place, Apr. 19, J. N. Knull, 5 females; same place and date, D. M. DeLong, 2 males and 2 females; Lacoochee, Aug. 18, 1930, P. W. Oman, 2 males and 1 female; same place, July 7, 1948, E. L. Todd, 16 males and 14 females; Lake Placid, Feb. 13, 1943, M. Cazier, 1 female; same place, July 13, 1948, B. T. McDermott, 3 males and 4 females; same place and date, H. W. Crowder, 7 males and 3 females; same place and date, E. L. Todd, 24 males and 16 females; Leon Co., Lake Jackson, June 22, 1922, J. S. Alexander, 1 male and 1 female; Liberty Co., Apr. 16, 1938, F. E. Lutz, 1 female; Lake Worth, Feb. 6, 1924, C. S. Bromley, 1 female; Liberty Co., Rock Bluff, July 19, 1930, H. Spieth, 1 female; M'Clamery Co., Apr. 2, 1927, C. O. Bare, 18 males and 13 females; Moore Haven, Apr. 17, D. M. DeLong, 2 males; same place and date, J. N. Knull, 1 male and 3 females; Otter Creek, July, 6, 1948, B. T. McDermott, 7 males and 6 females; same place and date, R. H. Beamer, 2 females; same place and date, H. W. Crowder, 6 males and 2 females; same place and date, E. L. Todd, 26 males and 23 females; Paradise Ky., Apr. 10, J. N. Knull, 4 males and 2 females; Pensacola, June 26, 1948, R. H. Beamer, 1 male and 2 females; Perrine, no date or collector, 22 males and 15 females; Royal Palm Pk., Sept. 18, 1930, no collector, 1 male and 2 females; same place, Oct. 18, 1930, no collector, 1 male and 1 female; Suwannee Sprgs., July 3, 1948, B. T. McDermott, 1 female; Tavures, July 18, 1894, Heidemann, 2 females; Torreya Ravine, Liberty Co., Apr. 15, 1938, F. E. Lutz, 1 male and 1 female; Wakulla Sprgs. July 14, 1934, R. H. Beamer, 1

male; Wakulla, June 29, 1948, R. H. Beamer, 3 males and 4 females; same place and date, B. T. McDermott, 7 males and 13 females; same place and date, H. W. Crowder, 6 males and 5 females; same place, June 30, 1948, E. L. Todd, 12 males and 8 females; Winter Park, Mar. 21, 1938, F. E. Lutz, 1 female; Fla., no date or collector, 1 male and 1 female.

Georgia: Atlanta, May 14, 1911, J. C. Bradley, 1 male; Clayton, May 18-26, 1911, J. C. Bradley, 1 male and 1 female; Floyd Co., Rome, July 13, 1930, C. F. Byers, 1 female; Okefenokee Swamp, Aug. 3, 1934, R. H. Beamer, 1 female; same place, July 25, 1939, D. E. Hardy, 1 female; same place and date, J. D. Beamer, 5 males and 5 females; same place, Aug. 1, 1939, R. H. Beamer, 2 males; Spring Creek, Decatur Co., June 7-23, 1911, J. C. Bradley, 2 males and 4 females; Thomasville, July 31, 1927, C. H. Martin, 1 female; same place, Aug. 21, 1927, C. H. Martin, 1 male and 1 female; same place, Aug. 28, 1927, C. H. Martin, 1 female; same place, June 30, 1948, B. T. McDermott, 1 female; same place and date, E. L. Todd, 3 females; same place, Mar. 26, 1903, no collector, 1 male.

Idaho: Parma, Sept. 4, 1934, C. H. Martin, 1 male; Juliaetta, no date or collector, 1 male and 1 female; Id., no date or collector, 1 male.

Illinois: Villa Ridge, June 7, 1892, no collector, 1 male.

Indiana: Jefferson Co., Hanover, Aug. 28, 1922, T. H. Hubbell, 1 female (Mich. Coll.); Kosciusko Co., May 13, 1932, G. E. Gould, 1 male and 1 female; Lake Co., Gary, no date,

H. Ramstadt, 1 female (Mich. Coll.); Warsaw, Apr. 19, 1932, G. E. Gould, 1 male and 1 female.

Kansas: Bourbon Co., 1915, R. H. Beamer, 1 male; Chanute, no date, G. Wiley, 3 males; same place, Dec. 20, 1919, H. B. Hungerford, 1 male and 1 female; Cherokee Co., Aug. 1920, H. B. Hungerford and R. H. Beamer, 7 males and 10 females; same place, Aug. 29, 1926, R. H. Beamer, 3 males and 3 females; Coldwater, Sept. 7, 1923, C. O. Bare, 3 males and 1 female; same place, Apr. 1925, R. H. Beamer and C. O. Bare, 5 males and 4 females; same place, June 19, 1927, R. H. Beamer, 1 male and 1 female; Commanche Co., Aug. 1922, C. O. Bare, 2 males and 2 females; same place, Aug. 23, 1924, C. O. Bare, 5 males and 5 females; Douglas Co., Oct. 23, 1926, H. B. Hungerford, 1 male and 1 female; same place, Oct. 8, 1946, B. Hodgden, 2 males; same place, Apr. 4, 1948, G. T. Brooks, 1 male and 3 females; same place, Apr. 8, 1950, W. Smith, 3 males and 1 female; Elsworth Co., July 3, 1923, C. H. Martin, 1 male; Graham Co., Aug. 16, 1912, F. X. Williams, 5 males and 2 females; Great Bend, Oct. 1920, Cavanaugh, 5 females; Lake View, Oct. 1925, H. B. Hungerford, 1 male and 1 female; Logan Co., no date, F. X. Williams, 3 males and 4 females; Meade Co., 13 mi. SW. Meade, Aug., 1939, C. W. Hubbard, 1 female (Mich. Coll.); same place, no date or collector, 1 male; Montgomery Co., Elk City, 1927, H. B. Hungerford, 2 males and 1 female; Morton Co., July 20, 1924, C. O. Bare, 21 males and 15 females; Neosho Co., 1919, G. Wiley, 5 males and 5 females; Norton Co., Aug. 24, 1912, F. X. Williams, 1 male; Onaga, July 13, 1925, R. H. Beamer,

1 female; Pawnee Co., July 26 - Aug. 2, 1917, no collector, 7 males and 3 females; same place, no date, H. B. Hungerford, 7 males and 10 females; Reno Co., Oct. 4, Lantz, 1 male; Rice Co., July 3, 1923, R. H. Beamer, 6 males; same place, July, 1923, C. H. Martin, 1 female; same place and date, L. C. Woodruff, 1 female; Riley Co., Apr. 22, 1924, R. H. Beamer, 1 female; same place, Sept. 20, J. B. Norton, 17 males and 3 females; Saline Co., July 14, 1923, W. B. Whitlow, 1 male and 3 females; Shawnee Co., Apr. 1, 1945, A. M. Egbert, 1 female; Wallace Co., no date, F. X. Williams, 1 male and 3 females; same place, no date or collector, 1 female; Yates Center, July 30, 1923, R. H. Beamer and P. B. Lawson, 1 male and 1 female.

Louisiana: Aloha, Dec. 23, 1931, R. H. Beamer, 1 female; Covington, June 23, 1948, R. H. Beamer, 3 males and 2 females; same place and date, E. L. Todd, 14 males and 15 females; Creole, June 17, 1948, R. H. Beamer, 2 males; same place, June 18, 1948, L. D. Beamer, 1 male; same place and date, E. L. Todd, 7 males and 9 females; Denham Sprgs., June 20, 1948, E. L. Todd, 1 female; Madison Parish, Allig. bayou, July 4, 1930, R. Bunn, 2 males and 1 female; Mandeville, June 24, 1948, R. H. Beamer, 1 male; same place and date, B. T. McDermott, 1 female; same place, June 25, 1948, E. L. Todd, 2 males and 3 females; Mound (#276), May 25, 1918, no collector, 2 males and 4 females; same place (#301), June 11, 1918, no collector, 2 males; Natchitoches Parish, Apr. 30, 1915, K. P. Schmidt, 1 male and 2 females.

Maryland: Glen Echo, June 9, O. Heidemann, 1 female;

Grt. Falls, May 13, 1890, Heidemann, 1 male; Plum Island, July 18, 1909, G. P. Engelhardt, 1 female; Md., July 4, 1886, Heidemann, 1 female.

Michigan: Ann Arbor, May 20, 1932, no collector, 1 male (Mich. Coll.); same place, May 30, 1929, W. Clanton, 1 male and 1 female (Mich. Coll.); Berrien Co., New Buffalo, Sept. 2, 1919, R. F. Hussey, 10 males and 7 females (Mich. Coll.); Berrien Co., E. K. Warren Preserv., Sand Dunes, Aug. 31, 1919, R. F. Hussey, 25 males and 18 females (Mich. Coll.): Berrien Co., E. K. Warren Preserv., Warren Woods, Sept. 1, 1919, R. F. Hussey, 3 males and 2 females (Mich. Coll.); Huron Co., Port Austin, Aug. 28, 1924, F. M. Gaige, 21 males and 13 females (Mich. Coll.); Huron Co., Sand Point, July 30, 1934, I. J. Cantrall, 1 female (Mich. Coll.); same place, Sept. 13, 1927, F. M. Gaige, 1 male (Mich. Coll.); Midland Co., Apr. 4, 1932, R. R. Dreisbach, 1 male (Mich. Coll.); Midland Co., Chippewa R., 8 mi. W. Midland, July 15, 1935, A. Olson - L. K. Cloyd, 1 female (Mich. Coll.); Monroe Co., 3 mi. W. Temperance, Aug. 12, 1941, I. J. Cantrall, 5 females (Mich. Coll.); Montcalm Co., no date or collector, 2 females (Mich. Coll.); Ottawa Co., Sept. 5, 1940, G. Orton, 1 male and 1 female (Mich. Coll.); Sanilac Co., 36 mi. S. Port Sanilac, June 29, 1941, A. Watson, 1 male and 1 female (Mich. Coll.); Walnut Lake, June 26, 1906, no collector, 3 females; Washtenaw Co., Apr. 28, 1932, no collector, 1 male (Mich. Coll.); same place, May 18, 1933, no collector, 1 male (Mich. Coll.); same place, May 23, 1933, no collector, 2 males (Mich. Coll.); same place, Apr. 23, 1935, no collector, 1 female

(Mich. Coll.); Washtenaw Co., Ann Arbor, May 18, 1933, R. M. Bailey, 1 male (Mich. Coll.); same place, May 24, 1932, R. M. Bailey, 1 female (Mich. Coll.); same place, May 8, 1937, J. J. Friauf, 3 males and 3 females (Mich. Coll.); Washtenaw Co., Irish Hills, May 15, 1932, R. M. Bailey, 1 female (Mich. Coll.); Washtenaw Co., North Lake, Sept. 22, 1935, L. J. Cantrall, 1 female (Mich. Coll.); Washtenaw Co., Sylvan Twp., Crooked Lake, May 8, 1937, D. L. & I. J. Cantrall, 6 males and 2 females (Mich. Coll.); Washtenaw Co., Third Sister Lake, Sept. 1, 1935, L. K. Gloyd, 3 males (Mich. Coll.); Washtenaw Co., Whitmore Lake, May 22, 1932, R. M. Bailey, 1 female (Mich. Coll.).

Mississippi: Hamilton, July 15, 1930, R. H. Beamer, 1 male and 2 females; Iuka, July 14, 1930, R. H. Beamer, 1 male and 1 female; Pass Christian, June 25, 1948, R. H. Beamer, 2 males and 3 females; same place and date, E. L. Todd, 6 males and 10 females; Smithville, July 15, 1930, R. H. Beamer, 1 female; Tuskegee, July 22, 1930, R. H. Beamer, 3 females.

Missouri: Black R., Clark Nat. Forest, July 22, 1937, C. P. Brown, 1 female (Mich. Coll.); Blackwell, May 1910, J. F. Abbot, 1 female; Hollister, July 28, 1929, no collector, 1 male and 1 female; Postosi, June 28, 1923, W. J. Clench, 1 female; St. Louis, Creul-Coenir Lake, May 1910, J. F. Abbot, 1 male; Van Buren, Ozark Mts., June 7, 1930, E. A. Pence, 2 females (Mich. Coll.); same place, June 16, 1930, E. A. Pence, 3 males and 1 female (Mich. Coll.); same place, June 12, 1930, E. A. Pence, 2 males (Mich. Coll.); same place, June 20, 1930, E. A. Pence, 1 male (Mich. Coll.); same place, July 9, 1930, E. A. Pence, 1 female (Mich. Coll.).

Nebraska: Jefferson Co., Apr. 20, 1924. H. B. Hungerford and R. H. Beamer, 2 females.

Nevada: Carson City, Aug. 9, 1929, R. H. Beamer, 1 female; same place, July, 1930, Wickham, 1 female; Reno, Sept. 14, 1940, LaR., 1 female; same place, Apr. 19, 1941, LaR., 1 female.

New Jersey: Anglesea, May 30, no collector, 1 male; Lakehurst, Sept. 4, 1911, F. M. Schott, 2 females; Rancoca, Aug. 29, 1927, E. M. Becton, 4 males and 4 females; Trenton, Aug. 8, no collector, 1 male.

New Mexico: Catron Co., Aug. 15, 1938, J. Hidalgo Jr., 5 males and 4 females; Monzano, June 26, 1941, B. Hodgden, 1 male; State College, Dona Ana Co., Oct. 5, 1936, no collector, 1 female; Valencia Co., McCartys, Sept. 19, 1926, C. L. Hubbs, 2 females (Mich. Coll.).

North Carolina: Charlotte, July 20, 1936, C. D. Lyman, 1 male (Mich. Coll.); Haywood Co., Crestmont, July 27, 1922, T. H. Hubbell, 3 females (Mich. Coll.); Hertford, no date, W. R. Walton, 1 male (USNM); Lake Ellis, May 8, 1906, no collector, 1 male; Roanoke Is., July 25, no collector, 2 females; Raleigh, Mar. 21, 1905, no collector, 3 males; same place, Mar. 24, 1905, no collector, 2 males and 3 females; same place, Mar. 25, 1905, no collector, 1 male; same place, Mar. 31, 1906, C. S. Brimley, 1 male and 2 females; same place, Apr. 7, 1906, C. S. Brimley, 1 male and 1 female; same place, Apr. 13, 1906, C. S. Brimley, 3 males and 3 females; same place, May 25, no collector, 1 male and 1 female; Southern Pines, May 15, 1919, A.

H. Manee, 3 males; Whitny, Apr. 22, 1907, no collector, 1 female; North Carolina, no date or collector, 1 female.

Ohio: Columbus, no date or collector, 1 female; Hocking Co., Good Hope Twp., Sept. 17, 1931, R. M. Bailey, 1 female (Mich. Coll.); Lucas Co., Spencer Twp., Sept. 24, 1938, I. J. Cantrall, 12 males and 13 females (Mich. Coll.); Lucas Co., 6 mi. W. Toledo, Sept. 24, 1938, I. J. Cantrall, 2 males and 2 females (Mich. Coll.).

Oklahoma: Commanche Co., Wichita Natl. Forest, June 11, 1926, T. H. Hubbell, 1 male (Mich. Coll.); McCurtain Co., Glover, June 16, 1938, W. F. Blair, 1 male.

Oregon: Boardman, July 15, 1931, L. D. Anderson, 1 male; Corvallis, Sept. 16, 1897, no collector, 1 male; same place, Sept. 28, 1899, no collector, 1 female; same place, 1906, Woods, 1 female; same place, Aug. 1907, no collector, 1 female; same place, Sept. 21, 1907, no collector, 1 female; Dilley, Aug. 20, 1902, no collector, 8 males and 9 females; Dixie, July 9, 1931, L. D. Anderson, 1 male; Eugene, July 15, 1941, Malkin, 1 female; Freewater, Sept. 8, 1914, G. F. Moznette, 1 male; same place, Sept. 9, 1914, G. F. Moznette, 1 male; same place, Sept. 21, 1914, G. F. Moznette, 1 female; Grant's Pass, Rogue R., Sept. 14, 1930, F. R. C., 1 male and 1 female; same place, Sept. 24, F. R. C., 1 female; Hood R., July 17, 1931, L. D. Anderson, 1 female; Monroe, June 18, 1930, M. H. Hatch, 1 female; Philomath, 1905, no collector, 1 female; St. Angel, no date, Heidemann, 1 male.

South Carolina: Cheraw, Apr. 24, 1938, F. E. Lutz, 1

male (AMNH); same place, Apr. 14, 1938, F. E. Lutz, 2 females (AMNH); same place, Apr. 7, 1938, F. E. Lutz, 1 female (AMNH).

Tennessee: Clarksville, July 3, 1939, E. G. Wegenek, 1 female; Coal Creek, June 28, 1916, W. S. Adkins, 2 males; Cumberland Co., Grassy Cove, July 14, 1922, T. H. Hubbell, 1 male (Mich. Coll.); same place, July 7, 1922, T. H. Hubbell, 1 female (Mich. Coll.); Elkmont, May 4, 1913, no collector, 1 female; Kenton, Aug. 4, 1948, B. T. McDermott, 3 males; Knoxville, June 6, 1890, no collector, 2 males and 2 females; same place, Apr. 25, 1911, no collector, 3 males and 2 females; same place, Apr. 11, 1914, no collector, 1 female; same place, May, 1914, no collector, 1 male and 1 female; same place, July 15, 1919, no collector, 1 male; same place, June, 190?, no collector, 1 male; Obion Co., Reelfoot Lake, Sept. 8, 1919, F. M. Gaige, 6 males and 5 females (Mich. Coll.); same place, Sept. 6, 1919, F. M. Gaige, 3 males and 5 females (Mich. Coll.); Perryville, July 20, 1926, T. E. White, 1 female; Scott Co., Big South Fork of Cumberland River, July 24, 1924, T. H. Hubbell, 1 female (Mich. Coll.); Thunderhead Mt., Blount Co., July 19, 1927, G. Steyskal, 2 males (Mich. Coll.).

Texas: Austin, Oct. 12, 1923, R. K. Nabors, 6 males; same place, Oct. 1899, no collector, 1 female; same place, Oct. 1900, A. L. Melander, 3 males and 1 female; same place, Nov. 18, 1899, no collector, 1 male; Burton, June 24, 1938, L. W. Hepner, 2 females; Cisco, June 19, 1947, R. Olmsted, 1 male; same place and date, L. D. Beamer, 1 female; Colorado Co., Apr. 3, 1922, G. Wiley, 17 males and 11 females; same place,

Apr. 7, 1922, G. Wiley, 2 males; same place, Apr. 11, 1922, G. Wiley, 13 males and 11 females; same place, Apr. 14, 1922, G. Wiley, 1 female; same place, Apr. 24, 1922, G. Wiley, 3 males; same place, May 6, 1922, G. Wiley, 1 male; same place, May 11, 1922, G. Wiley, 1 male and 1 female; same place, May 15, 1922, G. Wiley, 2 males; same place, May 16, 1922, G. Wiley, 9 males and 3 females; Comal Co., no date or collector, 1 male, and 3 females; Concan, July 6, 1936, R. H. Beamer, 1 female; Dallas Co., Apr. 14, 1938, Cole, 1 female; same place, Mar. 9, 1939, D. D. Millspaugh, 3 males and 1 female; same place, summer, 1931, J. K. G. Silvey, 3 females (Mich. Coll.); Eastland Co., May 6, 1921, G. Wiley, 1 female; same place, May 12, 1921, G. Wiley, 1 male; same place, May 17, 1922, G. Wiley, 1 male and 1 female; Guadalupe Co., 6 mi. N. New Braunfels, Feb. 22, 1946, I. J. Cantrall, 3 males and 1 female (Mich. Coll.); Peeler, June 22, 1938, D. W. Craik, 1 male and 1 female; Sequin, June 26, 1938, R. I. Sailer, 1 female; Tarrant Co., summer 1931, J. K. G. Silvey, 1 female (Mich. Coll.); Webb Co., summer 1931, J. K. G. Silvey, 1 male (Mich. Coll.); Willis, May 1903, Bridwell, 1 female; Texas, no date or collector, 3 males and 2 females; Texas, summer 1931, J. K. G. Silvey, 2 males and 1 female.

Utah: Beav. Cany., no date or collector, 1 male and 1 female.

Washington: Dayton, Apr. 17, 1934, C. H. Martin, 1 male and 1 female; Kalama R., July 21, 1931, L. D. Anderson, 3 males; same place and date, J. Nottingham, 1 female; Mason

Co., Lake Cushman, June 24, 1919, F. M. Gaige, 1 female (Mich. Coll.); Pasco, Apr. 17, 1934, C. H. Martin, 2 males and 1 female; Pullman, no date, C. V. Piper, 2 females.

Wisconsin: Milw. Co., Sept. 1, 1900, C. E. Brown, 1 female (Milw. Mus.).

Kentucky: Pineville, July 20, 1924, G. P. Engelhardt, 2 males and 2 females.

Ontario: Lambton Co., Stag Isl., Sept. 26, 1927, S. Moore, 1 male and 1 female (Mich. Coll.).

Mexico: Río Corona, 18 mi. NE. Victoria, Tamaulipas, Dec. 17, 1941, Cantrall - Friauf, 1 female (Mich. Coll.).

Africa: Cape of Good Hope, no date or collector, 2 females. These specimens apparently have been mislabeled, they may have come from Good Hope Twp., Ohio.

Comparative Notes. With the exception of G. rotundatus Champion, this is the only species the writer has seen from within the limits of the United States. It may be separated from the closely related species by the shape of the lateral margin of the pronotum and/or the male genitalia.

Gelastocoris oculatus variegatus (Guérin-Méneville)

(Pl. IV, fig. 6; Pl. VI, fig. 2)

1844. Galgulus variegatus Guérin-Méneville, Iconographie du Règne Animal de B. Cuvier., Part 7, p. 352.

1873. G. variegatus Guérin-Méneville; Uhler, Bull. U. S. Geol. Survey, Vol. I, No. 5, pp. 336-337.

1876. G. variegatus Guérin-Méneville; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1878. G. variegatus Guérin-Méneville; Uhler, Wheeler's Rept. to Chief of Engineers for 1877, p. 1331.

1886. G. variegatus Guérin-Méneville; Uhler, Bull. Brooklyn Ent. Soc., p. 27.

1894. G. variegatus Guérin-Méneville; Uhler, Proc. California Acad. Sci., Ser. 2, Vol. IV, p. 290.

1901. Gelastocoris variegatus (Guérin-Méneville); Champion Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, pp. 349-350, Pl. XX, figs. 19, 20.

1906. G. variegatus (Guérin-Méneville); Baker, Brooklyn Inst., Sci. Bull., I, p. 288.

1909. G. variegatus (Guérin-Méneville); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 181.

1914. G. variegatus (Guérin-Méneville); Van Duzee, Trans. San Diego Soc. Nat. Hist., II, p. 33.

1917. G. variegatus (Guérin-Méneville); Van Duzee, Catalogue of Hemiptera, Univ. California Publ., p. 473.

1929. G. variegatus (Guérin-Méneville); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 162-163, figs. 7, 21.

1929. G. variegatus (Guérin-Méneville); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 362, Pl. 58, fig. 8; Pl. 59, fig. 10.

1939. G. variegatus (Guérin-Méneville); Millspaugh, Field and Laboratory, Vol. VII, No. 2, p. 82.

Also referring to this subspecies:

1854. Galgulus pulcher Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Band XI, No. 3, p. 239.

1873. G. pulcher Stål; Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 171.

1876. G. pulcher Stål; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1909. G. pulcher (Stål); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. G. pulcher (Stål); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 362.

Size. Male: Length, 5.7 to 6.5 mm.; width of pronotum, 3.4 to 4.2 mm.; width of abdomen, 3.5 to 4.2 mm. Female: Length, 6.6 to 7.5 mm.; width of pronotum, 4.3 to 4.7 mm.; width of abdomen, 4.3 to 4.8 mm.

Color. Variegated, in general appearance usually light brown with patches of white and brown or black. Some species with areas of red, the amount varying with the individual specimen. Below, with the abdominal segments lighter laterally; legs ringed with light brown.

Structural Characteristics. Apex of head rounded or slightly pointed; front of head with moderate, broad, elevations; ocelli rather small, slightly smaller than the largest blister-like granules. Disc of pronotum not very rough; lateral margin with anterior portion subparallel to longitudinal axis of body, for a distance equal to two-thirds the length of the ocellocular space, then lateral margin extending almost directly laterad to the lateral angle, postero-

-lateral margin strongly projecting for anterior two-thirds, posterior third converging from the projection to the posterior angle of pronotum, anterior two-thirds of postero-lateral margin very strongly serrate; lateral angle projecting beyond base of embolium; width of pronotum subequal to width of abdomen; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond end of abdomen; membrane well developed; basal half of lateral margin of embolium expanded, about two times as wide as largest blister-like granules, lateral margin serrate, expansion angulate posteriorly. Connexivum visible in both sexes, but a little more evident in the females than in the males. The blister-like granules not very numerous, usually five or six in number of each hemelytron, largest granule about as wide as base of hind tarsus. Seventh ventral abdominal segment of male with the spatulate right side partially covered by preceding segment, spatulate right side short not reaching lateral margin, broad, quite rounded and constricted at base of spatula; left side projecting posteriorly only slightly. Female ventral abdominal segments nearly symmetrical, incision bent to the left. Male genitalia practically identical to G. oculatus oculatus (Fabricius).

Location of Type. Unknown. Possibly in the Museum of Paris, although Doctor H. B. Hungerford did not find it there in 1928.

Distributional Data. Described from the Bay of Campeche, Mexico. Champion says that this form occurs from the southern and southwestern United States to Argentina and also the Antilles and Cuba. This is rather unlikely in the opinion

of the writer. The subspecies is apparently restricted to Central America and Mexico and perhaps is present on some of the Caribbean islands. The writer has seen specimens from the following localities:

Mexico: San Bernardo, Río Mayo, Sonora, Oct. 14, 1934, H. S. Gentry, 2 females; Oaxaca, Oax., Sept. 19, 1923, E. G. Smyth, 1 female, (USNM); same place, Aug. 20, 1937, M. Embury, 3 males; Vera Cruz, V. C., no date, Wickham, 2 males and 1 female.

Guatemala: Gualán, Jan. 14, 1905, no collector, 6 males and 2 females; same place and date, Drake, 1 male; Los Amates, Jan. 16, 1905, no collector, 4 males and 2 females; same place, no date or collector, 1 male and 2 females, (MCZH).

Honduras: Progreso, Nov. 29, 1923, T. H. Hubbell, 1 male and 1 female.

British Honduras: Río Grande, Jan. 1932, J. J. White, 17 males and 11 females.

Panama: Progreso, Chiriquí Prov., Apr. 18, 1923, F. M. Gaige, 4 males and 1 female.

Comparative Notes. In the original description there is no statement to the effect that the pronotum has the lateral margin posteriorly extending transverse, yet Champion uses this as though it were a known fact. The original description was based entirely upon color which could apply to specimens of at least four or five species. It may be

that Champion had seen Guérin's type, although he does not say so. Some specimens of G. oculatus (Fabricius) approach this subspecies in the shape of the lateral margin of the pronotum, but to my knowledge there is no cline in existence for this character. The genitalia as mentioned above are practically identical to G. oculatus (Fabricius), differing no more from this species than the individual variation within that species. In consideration of these facts, it seems best to place G. variegatus (Guérin-Méneville) as a subspecies of G. oculatus (Fabricius).

Gelastocoris rotundatus Champion

(Pl. IV, fig. 7; Pl. VI, fig. 1)

1901. Gelastocoris rotundatus Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, pp. 347-348, Pl. 20, fig. 18.

1909. G. rotundatus Champion; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. G. rotundatus Champion; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 155-156, fig. 10.

1929. G. rotundatus Champion; Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 363, Pl. 58, fig. 16, Pl. 59, figs. 8, 19e and 19f.

1939. G. rotundatus Champion; Millspaugh, Field and Laboratory, Vol. VII, No. 2, p. 83.

Size. Male: Length, 6.4 to 7.8 mm.; width of pronotum, 4.1 to 5.0 mm.; width of abdomen, 4.5 to 5.5 mm. Female: Length, 7.1 to 8.7 mm.; width of pronotum, 4.5 to 5.3 mm.; width of abdomen, 5.0 to 5.8 mm.

Color: Quite variable as in other species, mostly light yellowish-brown, others decidedly reddish, grey or black. Specimens may be nearly concolorous or with distinct patterns, i. e., scutellum and disc of pronotum black, rest light yellow or yellowish brown.

Structural Characteristics. Body almost oval due to peculiar form of pronotum. Apex of head rounded; front not especially rough; ocelli moderate in size, slightly larger than largest blister-like granules. Pronotum with disc rather smooth; lateral margin of pronotum very slightly

concave anteriorly then extending postero-laterad to lateral angle, usually slightly convex; lateral angle bent ventrad, not at all visible from above, only very slightly projecting laterad beyond base of embolium; abdomen wider than pronotum; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond the end of the abdomen; membrane well-developed; basal half of lateral margin of embolium scarcely expanded laterally, entire lateral margin of embolium nearly smooth and rounded. Connexivum completely or nearly completely covered by the hemelytra. Blister-like granules few, small, the largest less than width of hind tarsus in size, all granules are small and rather uniform. Spatulate right side of seventh ventral abdominal segment of male short, rounded, not extending to the lateral margin of the abdomen; left side not or only slightly projecting posteriorly. Female ventral abdominal segments nearly symmetrical, incision of the posterior margin of last segment slightly bent to the left. Keel hood of male genitalia covering apex of keel, fringe more or less concave in middle and bent rather abruptly antero-laterad on right side; keel hook present, recurved back toward base of pan; pan not very large, apex flattened at right angles to the base, round and with a slight crescent-shaped depression on ventral half; right clasper hook reduced, apical portion digidiform, short, basal transverse portion widest at base, slight lateral projection present at base of digidiform apex; tumescence of

right clasper not adnate to base of clasper; antero-lateral projection of keel absent.

Location of Type. In the British Museum at London, England.

Distributional Data. Champion gives the distribution of this species as Mexico and Guatemala. Martin reported it from Arizona and Millspaugh has reported it from Texas. The writer has examined specimens from the following localities:

Texas: Glenn Spring, Brewster Co., June 21, 1928, F. M. Gaige, 3 males and 8 females, (Mich. Coll.); Kerr Co., Apr. 9, 1939, D. Millspaugh, 2 females.

Arizona: Castle Hot Springs, Aug. 5, 1941, R. H. Beamer, 7 males and 13 females; same place and date, B. Hodgden, 25 males and 29 females; same place and date, L. H. Banker, 4 males and 3 females; same place and date, E. L. Todd, 1 male; Douglas, Aug., F. H. Snow, 2 females.

Mexico: Corriente, Aug. 24, 1927, H. D. Thomas, 1 male and 3 females; Colima Vulcano, no date, L. Conrad, 1 male; San Luis&Barbarocos, Chihuahua, Dec. 30, 1934, H. S. Gentry, 1 female; Garrapatas, Gro., kil. 369 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 1 female; La Sabana, Guerrero, kil. 226 S. Mex. City, Oct. 10, 1936, H. D. Thomas, 9 males and 9 females; Río Balsas, jct. Acapulca Hwy., Guerrero, June 24, 1932, H. Smith, 1 female; Tecolotlán, Jalisco, July 16,

1938, H. D. Thomas, 2 females; same place, Sept. 14, 1938, L. J. Lipovsky, 2 males and 1 female; Unión de Tula, Jalisco, Sept. 16, 1938, H. D. Thomas, 13 males and 7 females; El Sabino, Uruapan, July 20, 1936, H. D. Thomas, 5 males and 1 female; Near Chinapa, Michoacan, Sept. 5, 1938, H. D. Thomas, 1 male and 2 females; Tancítaro, Michoacán, July 29, 1940, H. Hoogstraal, 4 males and 3 females; Alpuyeca, Morelos, kilm. 102 S. Mex. City, Oct. 15, 1936, H. D. Thomas, 1 male; Cuernavaca, Morelos, Aug. 3, 1938, L. J. Lipovsky, 1 female; Río Amacuza, Morelos, kilm. 133 S. Mex. City, Oct. 14, 1936, H. D. Thomas, 1 male and 1 female; Palmar Dist., Alamos, Sonora, Oct. 27, 1934, H. S. Gentry, 4 males and 6 females; Arroyo de los Mascales, Río Mayo, Sonora, Feb. 16, 1935, H. S. Gentry, 2 females; San Bernardo, Río Mayo, Sonora, Oct. 14, 1934, H. S. Gentry, 8 males and 6 females; Tejupilco, Dist. of Temascaltepec, June-July, 1933, H. E. Hinton, 8 males and 9 females; near Tarandacuao, Aug. 6, 1932, H. Smith, 2 males and 1 female; "Mex.", no date and no collector, 1 female, (MCZH).

Guatemala: Gualán, July 14, 1905, no collector, 1 male; "Sonarate", no date, Kellerman, 1 female, (MCZH); "Guatemala," no date or collector, 5 males and 3 females, (MCZH), 1 female compared with type by Doctor H. B. Hungerford.

Honduras: Copán, Feb. 16, 1937, C. Roys, 1 male.

Comparative Notes. The oval shape of the body and the shape of the pan of the male genitalia will separate this

species from G. oculatus (Fabricius) to which it is apparently quite closely related.

Gelastocoris hungerfordi Melin

(Pl. V, fig. 1; Pl. VI, fig. 4)

1929. Gelastocoris hungerfordi Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 168, figs. 5, 27-31.

Also referring to this species:

1929. Gelastocoris cucullatus Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, pp. 363-364, Pl. 58, fig. 6, Pl. 59, figs. 11, 12, 13.

1939. G. cucullatus Martin; Millspaugh, Field and Laboratory, Vol. VII, No. 2, pp. 82-83.

Size. Male: Length, 5.9 to 6.5 mm.; width of pronotum, 3.5 to 4.1 mm.; width of abdomen, 3.6 to 4.2 mm. Female: Length, 6.2 to 7.4 mm.; width of pronotum 3.9 to 4.5 mm.; width of abdomen, 4.0 to 4.9 mm.

Color. In general appearance ranging from almost white to a very dark brown. Both color and pattern extremely variable. Colors present are red, brown, yellow, white, black, and green. Below, abdomen variable, from pale yellow to dark brown, but most specimens have the median area of abdomen darker than rest of specimen. Legs ringed with brown, front femora frequently with rings expanded, fused and covering almost the basal two-thirds of the femur, the fusion is not complete and there are spots of paler coloration present.

Structural Characteristics. Apex of head rounded; front not at all rough; ocelli fairly large, larger than the blister-like granules of the hemelytra. Disc of pronotum not very rough; lateral margin of pronotum subparallel for a distance about equal to ocellocular space, then extending

diagonally postero-laterad to the lateral angle, this portion of lateral margin slightly convex; postero-lateral margin nearly straight and converging to humeral angle of pronotum; lateral angle projecting beyond base of embolium; abdomen slightly wider than pronotum; base of pronotum lacking short, longitudinal carinae. Hemelytra extending beyond end of abdomen; membrane well-developed; basal half of lateral margin of embolium slightly expanded, expansion equal to one-fourth or one-fifth of the ocellocular space, expansion rounded or obtusely angulate posteriorly. Connexivum usually slightly exposed, some males have the connexivum completely covered by the hemelytra. Blister-like granules of the hemelytra few, small, less than width of base of hind tarsus. Spatulate right side of seventh ventral abdominal segment of male short, not extending to the lateral margin of the abdomen, partially covered by the preceding segment; left side only slightly projecting posteriorly. Female ventral abdominal segments symmetrical except for incision of posterior margin of last segment, which is strongly bent to the left. Keel hood of male genitalia rather long, mainly to the right side of keel, but covering most of apex; membranous secondary keel hood present and nearly as large as keel hood; fringe of keel hood with right side nearly transverse and slightly concave, left half extending almost anteriorly to left margin of keel; keel hook present, slender, recurved to base of pan; pan small, thick, rounded

apically and apex provided with slight circular depression; right clasper hook, like that of G. oculatus (Fabricius) and G. rotundatus Champion, apical portion digidiform, transverse basal portion much wider, with distinct lateral projection at base of digidiform apex; tumescence of right clasper not adnate to basal portion of clasper; antero-lateral projection of keel absent.

Location of Type. In the Museum of Paris, Paris, France.

Distributional Data. The types are from Venezuela. Melin also examined specimens from Mexico, Guatemala, Nicaragua, Costa Rica, Panama and Colombia. Millspaugh reports this species from Texas, but the writer has not seen any specimens from that state. The writer has seen specimens from the following localities:

Mexico: Acapulco, Guerrero, Aug. 16-30, 1938, L. J. Lipovsky, 1 male; same place, Aug. 28, 1938, L. J. Lipovsky, 1 female; 10 mi. S. Chilpancingo, Guerrero, June 23, 1932, H. Smith, 1 female; La Sabana, Guerrero, kilm. 226 S. Mex. City, Oct. 20, 1936, H. D. Thomas, 27 males and 25 females; Mexcala, Guerrero, Río Balsas, Dec. 14, 1928, Dampf., 5 males and 3 females; Rincón, Guerrero, kilm. 260 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 2 males and 2 females; Río Agua, Guerrero, kilm. 437 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 16 males and 11 females; Guerrero, kil. 438 S. Mex. City, Nov. 1, 1936, H. D. Thomas, 3 males and 3 females; "Sacacoyuca",

Gro., kilm. 216 S. Mex. City, Oct. 31, 1936, H. D. Thomas, 3 males and 2 females; Tecolotlán, Jalisco, Sept. 14, 1938, L. J. Lipovsky, 1 female; Alpuyeca, Morelos, kilm. 102 S. Mex. City, Oct. 15, 1936, H. D. Thomas, 19 males and 26 females; "Río Amacuya", Morelos, kilm. 133 S. Mex. City, Oct. 14, 1936, H. D. Thomas, 7 males and 9 females; 5 mi. S. Valles, San Luis Potosí, June 13, 1932, H. Smith, 2 males and 3 females; Río Mayo, San Bernardo, Sonora, Oct. 14, 1934, H. S. Gentry, 2 females; Tejupilco, Dist. of Temascaltepec, June-July, 1933, H. E. Hinton, 2 males; Minatitlán, Vera Cruz, Sept. 22, 1936, H. D. Thomas, 1 male.

Guatemala: El Salto Escuintla, 1934, F. X. Williams, 1 male and 1 female; Gualán, Jan. 14, 1905, no collector, (holotype of G. cucullatus Martin); same place, Jan. 4, 1905, no collector, 2 males and 2 females; Guatemala City, no date, Champion (1 male paratype of G. cucullatus Martin); Los Amates, Jan. 16, 1905, no collector, 2 males and 1 female (paratypes of G. cucullatus Martin); same place, no date, Kellerman, (4 male paratypes of G. cucullatus Martin).

Honduras: Copán, Feb. 18, 1937, C. Roys, 3 males and 2 females; Progreso, Feb. 23, 1936, J. Deal, 5 males and 4 females.

Nicaragua: "Nicaragua," O. Sacken., 1 male, (AMNH); ?, O. Sacken., (1 male paratype of G. cucullatus Martin), (AMNH).

Costa Rica: Rio Torres, Feb. 10, 1932, H. Schmidt,

3 females; "Río Virilla", Dec. 26, 1931, H. Schmidt, 55 males and 48 females; San José, June and July, 1931, H. Schmidt, 2 males and 2 females; San José, 1932, H. Schmidt, 16 males and 40 females.

Panama: Barro Colorado, C. Z., July 13, 1924, N. Banks, (1 female paratype of G. cucullatus Martin), (MCZH); same place, Dec. 22, 1928, C. H. Curran, 1 male (AMNH); Caldera, Feb. 28, 1935, D. V. Brown, 38 males and 33 females; Cochea River, Mar. 6, 1935, D. V. Brown, 4 males and 3 females; Gamboa, C. Z., Apr. 2, 1921, J. G. Sanders, 4 males and 8 females; Progreso, Chiriquí Prov., Apr. 18, 1923, F. M. Gaige, 1 female; "Pehonoma", 1926, H. Brown, (allotype female of G. cucullatus Martin).

Colombia: "Arroyo de Arenas", Sta. Marta Mts., July 25, 1920, F. M. Gaige, 1 male and 2 females, (Mich. Coll.); "Cuyaima Tolima", Nov. 9, 1944, R. A. Stirton, 1 female; Villavieja, 1944, R. A. Stirton, 3 females.

Comparative Notes. Externally, very similar to G. oculatus (Fabricius), but considerably smaller than most specimens of the latter species. Easily separated by the presence of a large, membranous secondary keel hood on the male genitalia.

Gelastocoris vicinus Champion

(Pl. IV, fig. 8; Pl. VI, fig. 3)

1901. Gelastocoris vicinus Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 349.

1906. G. vicinus Champion; Torre-Bueno, Ent. News, Vol. XVII, p. 54.

1909. G. vicinus Champion; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 181.

1917. G. vicinus Champion; Van Duzee, Catalogue of Hemiptera N. Am., Univ. California Publ., p. 473.

1929. G. vicinus Champion; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 163-164, fig. 22.

1929. G. vicinus Champion; Martin, Univ. Kansas Sci. Bull. Vol. XVIII, No. 4, pp. 362-363, Pl. 58, fig. 7, Pl. 59, fig. 9.

1939. G. vicinus Champion; Millspaugh, Field and Laboratory, Vol. VII, No. 2, p. 88.

Size. Male: Length, 6.2 to 7.1 mm.; width of pronotum, 3.9 to 4.3 mm.; width of abdomen, 4.0 to 4.3 mm. Female: Length, 7.1 to 8.0 mm.; width of pronctum, 4.3 to 4.8 mm.; width of abdomen, 4.3 to 5.0 mm.

Color. In general appearance usually some shade of brown. Of approximately one hundred specimens, there is one that is light green and only three that are light brown or yellowish-brown. The black spot of the corium at the middle of the claval suture, as well as other black spots of the hemelytra, are quite conspicuous on most specimens. The color and patterns are variable to some extent, but not to the degree as in some of the other species. Colors present

are red, brown, black, yellow, green and white, although the last two are not commonly found. Below, abdomen usually with lateral portions lighter than median portion, but abdomen as a whole lighter than upper surface of body, occasionally suffused with red. The legs ringed with dark brown, the front femora indistinctly ringed, but this may vary to almost completely fused rings, the intensity of the brown is also variable.

Structural Characteristics. Apex of head rounded; front quite rough; ocelli rather large, one and one-half times size of largest blister-like granules. Disc of pronotum rough; lateral margin subparallel for a distance equal to one and one-fourth times the width of the ocellocular space, slightly divergent posteriorly, then extending postero-laterad to lateral angle; postero-lateral margin concave; width of pronotum subequal to width of abdomen; distinctly projecting laterad beyond the base of embolium; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond the end of abdomen in both sexes; membrane well-developed; basal half of lateral margin of embolium expanded laterad, width of the expansion equal to one-half the ocellocular space, expansion acute or obtusely angulate posteriorly. Connexivum visible in both sexes, but not too exposed. Blister-like granules numerous, not very large, about equal in size to base of hind tarsus, many of the smaller ones more elevated, becoming peg-like. Spatulate

right side of seventh ventral abdominal segment of male short, not extending to lateral margin of the abdomen, about one-half covered by the preceding segment; left side moderately projecting posteriorly. Female ventral abdominal segments more or less symmetrical except that the incision of the posterior margin of the last segment is slightly bent to the left. Keel hood of male genitalia triangular, covering apex, fringe nearly transverse, following margin basad on right side of keel; keel hook present, fairly stout, not very recurved, but reaching margin of pan; pan short, more or less flattened and in an oblique plane in respect to the horizontal plane of the genital capsule; right clasper hook with digidiform apex, transverse basal portion very wide at base and narrowing rapidly to base of digidiform apex; tumescence of right clasper not adnate to basal portion of clasper; antero-lateral projection of keel absent.

Location of Type. In the British Museum at London, England.

Distributional Data. In the original description Champion gives for the distribution of this species the following: "Habitat: North America, southern and western United States; Mexico; Panama; South America to Brazil." This seems too great a range to the present writer, as he has not seen specimens from the United States or from South America. It seems likely that the records of species from these areas have been based upon misidentifications. The

writer has studied specimens from the following localities:

Mexico: Colima, Vulcano, no date, L. Conrad, 1 female, compared with type by Doctor H. B. Hungerford; La Sabana, Guerrero, kilm. 226 S. Mex. City, Oct. 20, 1936, H. D. Thomas, 1 female; Chiapas, Juárez, Mar. 19, 1939, P. Brodkorb, 1 male, (Mich. Coll.); Cuautla, Morelos, June 27, 1948, P. P. Dowling, 1 male, (Mich. Coll.); Tejupilco, Dist. of Temascaltepec, June-July, 1933, H. E. Hinton, 4 males; Nayarit, Tepic, Mar., 1923, no collector, 2 females, (USNM); 5 mi. S. Valles, San Luis Potosí, June 13, 1932, H. Smith, 1 female.

Guatemala: Los Amates, Jan. 16, 1905, no collector, 2 females.

Honduras: Aguán R. valley, Copete farm, Apr. 10, 1923, T. H. Hubbell, 1 female; Copán, Feb. 18, 1937, C. Roys, 1 male; "Tela, Guaimas Dist.", May 10, 1923, T. H. Hubbell, 2 females.

Costa Rica: San José, June-July, 1931, H. Schmidt, 4 males and 6 females; same place, purchased 6, 1931, H. Schmidt, 2 females; same place, 1932, H. Schmidt, 5 males and 2 females; same place, no date, Heidemann, 2 males; R. "Surubres", San Mateo, Feb. 1905, P. Biolley, 35 males and 29 females; Río Torres, Feb. 10, 1932, H. Schmidt, 1 female; "Río Virilla", Dec. 26, 1931, H. Schmidt, 32 males and 18 females; "Surrubres", no date, A. Heyne, 3 males and 5 females.

Panama: Barro Colorado, July 31, 1924, N. Banks, 2 females, (MCZH); Boquete, Chiriquí Prov., Mar. 2, 1923, F. M. Gaige, 1 female; Cochea River, Mar. 6, 1935, D. V. Brown, 1 female.

Isla de Pinos: Jan. 15, 1923, C. H. Ballou, 1 female.

Comparative Notes. Similar to G. oculatus (Fabricius), but with the posterior portion of the lateral margin of the pronotum straighter and the lateral angle more angulate. Although the genitalia are similar to the genitalia of G. oculatus (Fabricius), there is one constant difference. The pan of this species is always in an oblique plane in respect to the horizontal plane of the genital capsule and the pan is more flattened.

Gelastocoris bufo (Herrich-Schäffer)

(Pl. IV, fig. 5; Pl. VI, fig. 5)

1839. Galgulus bufo Herrich-Schäffer, Die Wanzenartigen Insecten, V, p. 88, Pl. 174, fig. 536.

1873. G. bufo Herrich-Schäffer; Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 171.

1876. G. bufo Herrich-Schäffer; Uhler, Bull. U. S. Geol. Surv., Vol. I, No. 5, p. 337.

1876. G. bufo Herrich-Schäffer; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1895. G. bufo Herrich-Schäffer; Pittier and Biolley, Instituto fisico Georgrafico Nacional (Costa Rica), p. 23.

1901. Gelastocoris bufo (Herrich-Schäffer); Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 348, Pl. XX, fig. 16.

1906. G. bufo (Herrich-Schäffer); Torre-Bueno, Ent. News, Vol. XVII, p. 54.

1909. G. bufo (Herrich-Schäffer); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. G. bufo (Herrich-Schäffer); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 156-158, fig. 11.

1929. G. bufo (Herrich-Schäffer); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 360, Pl. 58, fig. 14.

Size. Male: Length, 7.0 to 8.0 mm.; width of pronotum, 4.1 to 4.6 mm.; width of abdomen, 4.4 to 4.9 mm. Female: Length, 8.1 to 8.8 mm.; width of pronotum, 4.7 to 5.3 mm.; width of abdomen, 4.8 to 5.5 mm.

Color. Variable, from pale yellow to black in general appearance. The main colors present are brown, red, yellow and black; a few specimens show some green coloration, but white is rarely found, except on some specimens, where it

is limited to the blister-like granules of the hemelytra. The pattern is as variable as the colors. Below, with the abdomen dark brown, legs annulated with dark brown, front femora with the basal two-thirds, except for a small yellow spot on the anterior margin at the middle, entirely dark brown.

Structural Characteristics. Apex of head rounded; front slightly elevated and moderately rough; ocelli small, subequal to the blister-like granules of the hemelytra in size, located on very small tubercles between the eyes. Pronotum with the disc moderately rough; lateral margin of pronotum slightly concave, extending postero-laterad to the lateral angle; postero-lateral margin nearly straight, extending postero-mesad to humeral angle, forming a right angle with the lateral margin; not quite as wide as abdomen; lateral angle projecting beyond the base of embolium; base of pronotum lacking short, longitudinal carinae. Hemelytra extending beyond the end of the abdomen in both sexes; membrane well-developed; basal half of lateral margin of embolium slightly expanded, width of expansion equal to one-third of ocellocular space, expansion posteriorly very obliquely rounded, tapering into margin of posterior half of embolium. Connexivum visible in both sexes. Blister-like granules very small, fairly numerous, two-thirds width of base of hind tarsus in size. Spatulate right side of seventh ventral abdominal segment of male only slightly covered by the preceding segment, not extending to the lateral margin of

the abdomen; left side projecting posteriorly only slightly. Female ventral abdominal segments nearly symmetrical. Keel hood of male genitalia broadly triangular, one-third to one-fourth as long as wide, fringe transverse, slightly concave; keel, just basad of keel hood, broadly expanded to the left; keel hook present, rather large, not recurved and apex not extending over any portion of pan; pan rather broad, cup-shaped due to large depression; right clasper hook similar to that of G. oculatus (Fabricius), apical half, thin, digidiform, transversal portion much thicker and increasing in width toward base; tumescence of right clasper not adnate to basal portion of right clasper; antero-lateral projection of keel absent.

Location of Type. Unknown. Other Hemipterous insects of the collection of Herrich-Schäffer are located in the Museum of Munchen, Munchen, Germany.

Distributional Data. The original description merely states: "Aus Amerika." Champion and Martin examined specimens from Mexico, Guatemala and Costa Rica. Melin studied specimens from these localities and from Panama. This worker has seen specimens from the following localities:

Mexico: Cocula, Jalisco, Nov. 1923, no collector, 1 female, (USNM); El Sabino, Urapan, Mich., July 20, 1936, H. D. Thomas, 2 females; same place, Aug. 2, 1936, H. D. Thomas, 1 female; Las Barrancas, Mar. 1923, W. M. Mann, 1 female, (USNM); San Antonio, Nr. El Salto, June 10, 1937, M. Embury,

18 males and 16 females; Real de Arriba, Dist. of Temascaltepec, May-June, 1933, H. E. Hinton, 25 males and 29 females; Tejupilco, Dist. of Temascaltepec, June-July, 1933, H. E. Hinton, 3 males and 4 females.

Guatemala: El Salto Escuintla, 1934, F. X. Williams, 1 male; Guatemala City, no date, Champion, 1 male; "Vera Paz, Dept. Baja," no date or collector, 1 female, (MCZH); "Guatemala," no date or collector, 1 female, (MCZH).

Costa Rica: "Río Virilla," Dec. 26, 1931, H. Schmidt, 2 males and 5 females; San José, June and July, 1931, H. Schmidt, 1 female; same place, purchased June, 1931, H. Schmidt, 1 male; same place, 1932, H. Schmidt, 1 female.

Panama: Cochea River, Mar. 6, 1933, D. V. Brown, 1 male.

Comparative Notes. This species is distinguished from most species by the lateral margin of the prontoum being nearly straight. It is easily spearated from G. angulatus (Melin) since this species lacks the short, longitudinal carinae of the pronotum and the genitalia are quite different. The male genitalia are rather similar to those of G. oculatus (Fabricius), but the pan is more flattened and shorter than in that species.

Gelastocoris amazonensis Melin

(Pl. V, fig. 4; Pl. VI, fig. 7)

1929. Gelastocoris amazonensis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 158, figs. 1, 3, 12.

Size. Male: Length, 7.9 to 8.2 mm.; width of pronotum, 4.6 to 4.9 mm.; width of abdomen, 4.6 to 4.9 mm. Female: Length, 7.5 to 8.6 mm.; width of pronotum, 4.8 to 5.0 mm.; width of abdomen, 5.0 to 5.1 mm.

Color. In general appearance brown to reddish-brown, nearly concolorous, the lateral portions of the pronotum slightly lighter than the disc, occasionally with darker areas along the lateral margins of the hemelytra. Colors present are mainly brown, red and black. Below, dark brown, legs lighter, ringed with dark brown. Blister-like granules of the hemelytra are very pale green in two specimens, light or dark brown in the others.

Structural Characteristics. Apex of head rounded; front rather rough; ocelli large, nearly twice the size of the blister-like granules. Disc of pronotum rather rough; lateral margin approaching that of G. bufo (Herrich-Schäffer), but a little more notched, margin extending diagonally, more posteriorly than laterally, for a distance equal to one and one-half times the ocellocular space, then proceeding postero-laterad to the lateral angle, usually there is a small triangular projection on the anterior one-third of the lateral margin, this projection is smaller than a similar projection in G. fuscus Martin; postero-lateral margin straight

slightly concave, extending from the lateral margin at almost a right angle, the postero-lateral margin is more convergent than in C. fuscus Martin; pronotum and abdomen about equal in width, the body rather elongate in appearance; lateral angle projecting laterad beyond base of embolium; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond the end of the abdomen; membrane well-developed; basal half of lateral margin of embolium slightly expanded, the expansion equal to one-third the width of the ocellocular space, margin weakly serrate, expansion acutely angulate posteriorly. Connexivum visible in both sexes, moderately expanded laterally. Blister-like granules of hemelytra small, fairly abundant, rather elevated, subconate, about one-half the width of base of hind tarsus in size. Spatulate right side of seventh ventral abdominal segment of male short, not extending to the lateral margin of the abdomen, oval in shape, nearly covered by the preceding segment; left side moderately projecting posteriorly. Female ventral abdominal segments symmetrical, incision of the posterior margin of the last segment rather broad. Keel hood of male genitalia crescent-shaped, fringe nearly transverse, concave; keel hook present, rather slender and not very recurved; pan flat with elongate apex which is twisted completely around; right clasper hook, simple, more or less sickle-shaped; tumescence of right clasper not adnate to basal portion of clasper; antero-lateral projection of keel absent.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Known only from Amazonas, Brazil. Melin studied specimens from Rio Autaz, Amazonas, Oct., A. Roman, holotype male, allotype female and 1 male paratype; Rio Negro, Umarituba, Amazonas, Apr. 28, A. Roman, 3 males and 3 females (paratypes); and Teffé, Amazonas, 1 male and 1 female paratypes. This writer has seen all the specimens from the first locality and 3 females paratypes from the second locality.

Comparative Notes. Resembling G. fuscus Martin and G. bufo (Herrich-Schäffer), but a more slender species than either of these. The worker has examined the genitalia of the holotype and of the male paratype from Rio Autaz. They are identical and extremely different from all other species. The pan is elongate, thin and twisted completely over.

Gelastocoris andinus Melin

(Pl. V, fig. 3; Pl. VI, fig. 10)

1929. Gelastocoris andinus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 159-160, fig. 14.

Also referring to this species:

1929. Gelastocoris duplicatus Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 364, Pl. 58, fig. 17, Pl. 59, fig. 7.

Size. Male: Length, 6.8 to 8.0 mm.; width of pronotum, 3.8 to 4.7 mm.; width of abdomen, 4.4 to 5.1 mm. Female: Length, 7.4 to 8.8 mm.; width of pronotum, 4.4 to 4.9 mm.; width of abdomen, 5.0 to 5.8 mm.

Color. In general appearance ranging from light brown to black, both color and pattern are quite variable. Colors present are yellow, orange, brown, black and green, but the latter is in the blister-like granulations of the hemelytra. Below, with the abdominal segments lighter laterally; legs ringed with brown, the intensity depending directly upon the darkness of the individual specimen.

Structural Characteristics. Apex of the head rounded; or slightly pointed; front of head with moderate elevations; ocelli small, about one-half to three-fourths the size of the largest blister-like granules. Pronotum with the disc moderately rough; lateral margin with anterior portion subparallel, but convex, for a distance equal to two-thirds the length of the ocellocular space, then lateral margin proceeding postero-laterad to the lateral angle, lateral margin very

faintly serrate to smooth; postero-lateral margin converging very slightly to the humeral angle of the pronotum, serrate; lateral angle projecting laterad only slightly beyond base of embolium; width of pronotum less than width of abdomen; base of pronotum lacking short, longitudinal carinae. Hemelytra of males extending to end of abdomen, in females hemelytra may reach end of abdomen or may be slightly shorter; membrane greatly reduced, limited to a narrow strip around the apex and extending along inner margin to claval suture; basal half of lateral margin of embolium expanded slightly, about the width of blister-like granule, expansion posteriorly may be either angulate or broadly rounded. Connexivum barely visible in the males, more evident but not prominent in the females. The blister-like granules fairly numerous, largest subequal in width to width of hind tarsi. Seventh ventral abdominal segment of male with spatulate right side nearly covered by sixth segment and not reaching the lateral margin of the abdomen; left side projecting posteriorly only slightly. Female ventral abdominal segments nearly symmetrical, the incision may be bent slightly to the left. Male genitalia very distinctive; keel hood rounded, broad, crescent-shaped, fringe of long hairs, extending transversely then basally along left margin of keel; keel hook absent, replaced by two very heavily sclerotized, broadly triangular projections; pan very distinctive, bilobed; right clasper hook short, sickle-shaped, very broad base, but rapidly narrowing; tumescence of right clasper not adnate to basal portion of

clasper; antero-lateral projection curved mesad, bluntly claw-shaped.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Melin described this species from a series of specimens collected at Bogotá, Colombia by Lindig. The writer has seen the holotype male, allotype female, 2 male and 3 female paratypes all of which are labelled as indicated above. In addition the writer has seen specimens from the following localities:

Ecuador: "Naranjapata", Dec. 14, 1933, F. X. Williams, holotype male, allotype female (G. duplicatus Martin); Cachabi, no date, Rosenberg, 1 male. Colombia: Mt. San Lorenzo, Santa Marta Mts., June 8, 1920, F. M. Gaige, 6 males and 2 females, (Mich. Coll.); same place, June 12, 1920, F. M. Gaige, 1 male and 1 female, (Mich. Coll.); same place, June 29, 1920, F. M. Gaige, 1 male and 4 females, (Mich. Coll.); same place, Aug. 17, 1920, F. M. Gaige, 1 male, (Mich. Coll.); Sasaima, Dec., 1936, A. María, 1 male and 1 female; Valle del Tabacal, Santa Marta Mts., Sept. 2, 1920, F. M. Gaige, 1 female, (Mich. Coll.). Panama: Gamboa, C. Z., Feb. 14, 1921, J. G. Sanders, 1 male; Ft. Clayton, C. Z., 1933, Cpt. R. F. Edwards, 1 female; Canal Zone, Mar. 19, 1945, Cpl. G. S. Ryan, 1 male and 2 females.

Comparative Notes. Externally rather similar to G. fuscus Martin and G. amazonensis Melin, but easily separated by the bilobed pan of the male genital capsule.

Gelastocoris peruensis Melin

(Pl. V, fig. 8; Pl. VI, fig. 9)

1929. Gelastocoris andinus peruensis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 160-161, figs. 4, 15.

Size. Male: Length, 7.7 to 8.4 mm.; width of pronotum, 4.4 to 4.8 mm.; width of abdomen, 5.1 to 5.6 mm. Female: Length, 8.6 to 10.0 mm.; width of pronotum, 4.7 to 5.5 mm.; width of abdomen, 5.7 to 6.4 mm.

Color. Nearly concolorous, in general appearance various shades of brown, usually reddish-brown. Legs usually slightly lighter than body, and faintly ringed with brown, the dorsal surface of the legs particularly, often suffused with red.

Structural Characteristics. Apex of head rounded to slightly pointed; front not very rough, nearly flat; ocelli on the antero-lateral surface of small elevations, very small, about three-fourths width of largest blister-like granules in size. Pronotum with the disc not very rough; lateral margin of pronotum subparallel for a distance equal to one and one-fourth the ocellocular space, slightly diverging posteriorly, then extending obliquely postero-laterad for a short distance to lateral angle; postero-lateral margins more or less subparallel, usually very slightly converging posteriorly or with entire margin convex; lateral angle scarcely projecting laterad beyond the base of the embolium; abdomen distinctly wider than the pronotum; base of pronotum lacking short,

longitudinal carinae. Hemelytra extending to end of the abdomen; membrane greatly reduced, limited to thin strip around apex and extending along inner margin to clavel surture; basal half of lateral margin of embolium scarcely expanded, width of expansion equal to one-eighth of ocellocular space, expansion posteriorly usually running smoothly into margin of posterior half of embolium or very weakly obtuse. Connexivum almost completely hidden in the males, a little more obvious in females, not at all prominent. Blister-like granules rather small, but numerous, about equal in width to base of hind tarsus. Spatulate right side of seventh ventral abdominal segment of male short, rounded, only slightly covered by preceding segment, not extending to lateral margin of abdomen; left side only slightly projecting posteriorly. Female ventral abdominal segments more or less symmetrical, incision of posterior margin of last segment broad. Keel hood of male genitalia semi-circular, broad, sclerotized overfold not very long, fringe long and extending completely across apex and down the left side of keel; keel hook short, not prominent, greatly modified, forming a heavily sclerotized roof over the base of the pan; pan elongate, rather flat; tumescence of right clasper not adnate to basal portion of clasper; right clasper hook curved, wide basally and tapering to a thin point apically, apical portion sickle-shaped; antero-lateral projection of keel present, slender, clavate and bent mesad.

Location of Type. In the Museum of Stockholm,

Stockholm, Sweden.

Distributional Data. Apparently confined to Perú. The writer has examined specimens from the following localities in Perú: Roque, nr. Moyobamba, Mar. 31, D. Melin, holotype female, 4 male and 1 female paratypes, (Mus. Stockholm); same place, Sept. 8, D. Melin, 1 male paratype, (Mus. Stockholm); Chandra Maya, no date or collector, 2 males and 1 female; Prov. La Mar. Sivia, Dept. Ayacucho, June 16-20, 1941, F. Woytkowski, 22 males and 17 females; Río Perené and Chanchamayo, Dept. Junín, May 1934, F. Woytkowski, 6 males and 6 females; Loc Shapajilla, Dept. Huanuco, July 29 to Aug. 10, 1938, F. Woytkowski, 1 female; Marcopata, no date or collector, 8 males and 10 females; Río Paucartambo, Quiroz, Dept. Junín, Jan. 1934, G. Nelson, 3 females; Tambo, Enenas Cam. del Pichis, July 3, 1920, Corn. Univ. Ex., 1 male; Rioja, Dept. San Martín, Sept. 9 to Oct. 3, 1936, F. Woytkowski, 2 males and 4 females; San Pedro, May 15-19, 1935, F. Woytkowski, 3 males; same place, May 29, 1935, F. Woytkowski, 8 males and 5 females; "Sani Beni, River Sani Beni", Sept. 5, 1935, F. Woytkowski, 3 males; "Peru," 1937, F. Woytkowski, 22 males and 25 females.

Comparative Notes. Similar to G. flavus (Guérin-Méneville) in external appearance, but, as pointed out in the comparative note of that species, easily separated by the genitalia. The genitalia show a relationship of this species to G. andinus Melin. Melin described peruensis as a sub-

species of the latter species, but the genitalia are quite distinct. Therefore, the writer has raised the name to specific status.

Gelastocoris flavus (Guérin-Méneville)

(Pl. V, fig. 6; Pl. VI, fig. 6)

1844. Galgulus flavus Guérin-Méneville, Iconographie du Règne Animal de B. Cuvier, Part 7, p. 351, Pl. 57, figs. 4, 4a.

1909. Gelastocoris flavus (Guérin-Méneville); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. G. flavus (Guérin-Menéville); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 161-162, figs. 2, 16-20.

Also referring to this species:

1844. Galgulus quadrimaculatus Guérin-Méneville, Iconographie du Règne Animal de B. Cuvier, Part 7, p. 351.

1876. G. quadrimaculatus Guérin-Méneville; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1909. Gelastocoris quadrimaculatus (Guérin-Méneville); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. G. quadrimaculatus (Guérin-Méneville); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, pp. 361-362, Pl. 58, figs. 1, 2, 3, 4, 5; Pl. 59, figs. 14, 15, 16.

1844. Galgulus nebulosus Guérin-Méneville, Iconographie du Règne Animal de B. Cuvier, Part 7, pp. 351-352.

1879. G. nebulosus Guérin-Méneville; Berg, Hemiptera Argentina, p. 184.

1909. Gelastocoris nebulosus (Guérin-Méneville); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1876. G. nebulosus var. b Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 137.

1909. Gelastocoris stali Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180 (named Stål's var. b).

1910 3.

Size. Male: Length, 5.5 to 8.0 mm.; width of pronotum, 3.7 to 4.6 mm.; width of abdomen, 4.2 to 5.3 mm. Female:

Length, 6.4 to 8.8 mm.; width of pronotum, 4.0 to 5.4 mm.; width of abdomen, 4.3 to 6.3 mm.

Color. Quite variable, ranging from light brown to almost black. Both colors and patterns extremely variable. Colors present are brown, black, orange, green, yellow and red. Blister-like tubercles of the hemelytra variable in color, orange, white, green, brown and black. Legs pale green to reddish-brown, ringed with brown, although the distinctness of the rings varies with the specimen.

Structural Characteristics. Apex of head pointed or very narrowly rounded; front slightly to moderately rough; ocelli fairly large, subequal to width of blister-like granules in size. Disc of pronotum rather rough; lateral margin subparallel for a distance equal to two and one-half times the ocellocular space, then extending postero-laterad for a short distance to lateral angle; postero-lateral margin straight, short, either subparallel or converging posteriorly; abdomen in specimens from Peru and Ecuador distinctly wider than pronotum, those from Brazil have the pronotum a little wider, but still less than width of abdomen; lateral angle scarcely projecting laterad of base of embolium; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond end of abdomen in males, extending to end of abdomen in females; membrane well-developed or reduced depending upon where the specimen was taken, those from Perú and Bolivia have the membrane reduced to about one-half its normal length; basal half of lateral margin of embolium

distinctly expanded laterad, the expansion about one-half the width of the ocellocular space, expansion obtusely angulate posteriorly. Connexivum not very visible, but not completely covered by the hemelytra. Blister-like granules numerous, equal to or slightly larger than width of base of hind tarsus. Spatulate right side of seventh ventral abdominal segment of male large, but not extending to the lateral margin of the abdomen, only slightly covered by the preceding segment; left side only slightly projecting posteriorly. Female ventral abdominal segments symmetrical, incision of the posterior margin of the last segment very broad. Keel hood of male genitalia short, crescent-shaped, fringe transverse, concave; keel hook present, greatly recurved, extending completely back across base of pan; pan more or less flat, wider than long and truncate or slightly rounded apically; right clasper hook large, with rather large lateral projection which gives the clasper a foot-like appearance; tumescence of right clasper adnate to base of clasper; antero-lateral projection of keel absent.

Location of Type. Unknown, it may be one of the unmarked specimens in the Museum of Paris. Doctor H. B. Hungerford examined the specimens there, in 1928, and was unable to locate the type.

Distributional Data: Guérin-Méneville described this species from a specimen from Brazil. It has also been reported from Perú, Ecuador, Venezuela, Bolivia and Argentina. The writer has seen specimens from the following localities:

Brazil: "Abama", no date, Mann, 1 female, (MCZH); Alto Paraná, Mar. 1929, F. Schade, 1 female; Ariro Angra dos Reis, Estado do Rio, Mar. 28, 1948, A. L. de Carvalho, 6 males and 7 females; same place, May 29, 1948, A. L. de Carvalho, 17 males and 18 females; Campinas, Estado do São Paulo, Mar. 10, 1924, F. X. Williams, 1 female; Campo Gde., Sao Paulo, no date or collector, 1 male and 1 female; Espírito Santo, no date or collector, 1 male and 3 females; Kabelstation, Sept. 25, 1938, Geyskes, 1 female; Lassance, Minas Ger., Nov. 9-19, 1919, R. G. Harris, 1 male and 1 female; Nova Teutonia, Bauru, May, 1947, F. Plaumann, 19 males and 9 females; Nova Teutonia, Marília, Apr., 1947, F. Plaumann, 1 male and 1 female; Nova Teutonia, "Tupan L. 1", Apr. 1947, F. Plaumann, 31 males and 23 females; Nova Teutonia, "Tupan L. 2", May, 1947, F. Plaumann, 6 males and 9 females; Pará, Aug. 4, 1915, H. S. Parish, 1 female; Rezende, Estado do Rio, Feb. 29, 1924, F. X. Williams, 1 female; Salfada, Cruzes, Oct. 5, 1908, no collector, 1 male, (Car. Mus.); São Paulo, Oct., 1947, F. Plaumann, 1 female; Zanderij, I, Boven Pará Dist., Apr. 23, 1927, no collector, 1 female.

Paraguay: "Albovena, Srojozuas", Nov. 16, 1926, F. Schade, 4 males and 7 females.

Venezuela: S. Esteban, Carabobo, Feb. 5, J. and E. B. Williamson, 1 male and 1 female, (Mich. Coll.).

Ecuador: Tena, Apr. 13, 1923, F. X. Williams, 1 female.

Peru: Aguaitia, Dept. Loreto, Sept., 1946, F. Woytkowski, 1 male; Boquerón de Padre, Abad. Cordillera,

Dept. Loreto, Aug. 3, 1946, F. Woytkowski, 1 male and 2 females; same place, Aug. 31, 1946, F. Woytkowski, 3 males and 1 female; Callanga, no date or collector, 1 male and 2 females; Prov. La Mar. Sivia, Dept. Ayacucho, June 16-20, 1941, F. Woytkowski, 1 male and 3 females; Loc Shapajilla, Dept. Huánuco, July 29 to Aug. 10, 1938, F. Woytkowski, 1 female; Río Perené, El Campamiento, June 18, 1920, Corn. Univ. Ex., 1 male and 1 female; Marcopata, no date or collector, 1 male; Puerto Bermúdez, Río Pichis, July 13-19, 1920, Corn. Univ. Ex., 1 male and 3 females; Río Paucartambo, Quiroz, Dist. Junín, Jan. 1934, G. Nelson, 4 males and 3 females; Río Perené and Chanchamago, Dept. Junín, May 1934, F. Woytkowski, 4 males; Tumaturmari, Aug., 1913, B. G., 3 males, (AMNH); Satipo, Dec., 1942, P. Papryzki, 1 female; same place, July, 1942, P. Papryzki, 1 male; Rioja, Dept. San Martín, Sept. 9 to Oct. 3, 1936, F. Woytkowski, 1 female; Río Negro, Nov. 4, 1935, F. Woytkowski, 1 female; "Sani Beni, Río Sani Beni", Aug. 5, 1935, F. Woytkowski, 1 male and 2 females; same place, Sept. 5, 1935, F. Woytkowski, 6 females; San Pedro, May 15-19, 1935, F. Woytkowski, 9 males and 11 females; same place, May 29, 1935, F. Woytkowski, 4 males and 9 females; "Perú," 1937, F. Woytkowski, 2 males and 1 female.

Bolivia: Santa Cruz, no date, J. Steinbach, 42 males and 44 females; Sud Yungas, Dept. de La Paz., Sept., 1938, A. M. Olalla, 1 male; "Bolívia," no date or collector, 1 female.

Chile: Santiago,* Aug. 26, 1949, L. E. Peña, 6 males.

Comparative Notes. Similar to G. peruensis Melin, especially in the case of specimens with the membrane of the hemelytra reduced. It may be separated from the latter species by the characteristic genital capsule, which has the keel hook recurved completely back across the base of the pan and has the tumescence of the right clasper adnate to the base of the clasper. The shape of the lateral margin of the pronotum will distinguish it from most other species.

Galgulus flavus, G. quadrimaculatus and G. nebulosus were described by Guérin-Méneville entirely upon color. Martin (11) follows Stål (18) in placing G. nebulosus (Guérin-Méneville) in synonomy with G. quadrimaculatus (Guérin-Méneville). He believed, however, that the latter species differed from G. flavus (Guérin-Méneville) in the shape of the lateral margin of the pronotum. He thought that G. flavus (Guérin-Méneville) had an almost straight margin like G. bufo (Herrich-Schäffer), but the figure of the species in Guérin-Méneville's paper shows it is identical to that which Martin called G. quadrimaculatus (Guérin-Méneville). As the latter species was described after G. flavus in the paper it must be considered a synonym. This is the view of Melin, and this worker agrees with him in this matter.

---

*This may be incorrect. Doctor H. B. Hungerford has recently received a shipment of insects from Mr. Peña which were not all completely marked as to locality. He has written to Mr. Pena concerning this matter, but at this date has not received a reply.

Gelastocoris fuscus Martin

(Pl. V, fig. 2; Pl. VI, fig. 11)

1929. Gelastocoris fuscus Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 364, Pl. 58, fig. 15, Pl. 59, fig. 17, 19a, 19b.

Size. Male: Length, 7.3 to 8.2 mm.; width of pronotum, 4.6 to 5.0 mm.; width of abdomen, 4.7 to 5.3 mm. Female: Length, 8.4 to 9.5 mm.; width of pronotum, 5.1 to 5.8 mm.; width of abdomen, 5.3 to 6.0 mm.

Color. In general appearance from pale to dark brown. Colors present are yellow, brown, black and green. The ground color is usually some shade of brown and there are patches of green and black on the hemelytra, but these patches are usually indistinct. In three specimens there is a yellow transverse band on the posterior portion of the pronotum, but this is not characteristic of this species as several others often exhibit this pattern of coloration. In about one-half of the specimens studied the tibiae and tarsi were green while the basal portions of the legs were yellow or yellow-brown in color.

Structural Characteristics. Apex of head rounded; front moderately rough; ocelli small, less than width of the largest blister-like granules in size. Disc of pronotum not very rough; lateral margin of pronotum subparallel for a distance equal to the ocellocular space, this portion has a small triangular lateral projection, then the margin extends postero-laterad to lateral angle; the postero-lateral margin straight or slightly concave, forming a right angle with the

lateral margin; lateral angle projecting laterad beyond the base of the embolium; abdomen slightly wider than the pronotum; base of the pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond the end of the abdomen; membrane well-developed; basal half of the lateral margin of the embolium only slightly expanded laterally, the expansion equal to one-sixth the width of the ocellocular space, expansion obtusely angulate or rounded posteriorly. Connexivum visible in both sexes, but more so in the females than in the males. Blister-like granules of the hemelytra moderate in size, not over two-thirds the width of the base of the hind tarsus, not very numerous. Spatulate right side of seventh ventral abdominal segment of male short, more or less ovate, not extending to the lateral margin of the abdomen, nearly hidden by the preceding segment; left side moderately projecting posteriorly. Female ventral abdominal segments nearly symmetrical, the incision of the posterior margin of the last segment rather broad. Keel hood located to the left side of the keel, fringe extending from near apex of keel to a point near the tip of the keel hook, keel hook present, rather stout, scarcely recurved; pan longer than wide, rounded apically, rather stout; right clasper hook, slender, fairly long, simple and sickle-shaped; tumescence of right clasper not adnate to base of clasper; antero-lateral projection of keel absent.

Location of Type. In the Francis Huntington Snow Entomological Collection at the University of Kansas, Lawrence, Kansas.

Distributional Data. Martin had specimens from Ecuador and Brazil before him, when he described this species. This worker has examined specimens from the following localities:

Ecuador: Baños, Jan. 22, 1923, F. X. Williams, allotype female; Near Napo, Feb. 14, 1923, F. X. Williams, 1 female paratype; Río Upano, Macas, Jan. 25, 1939, F. M. Brown; 1 female, (AMNH); Tena, Feb. 28, 1923, F. X. Williams, holotype male; same place, Feb. 23, 1923, F. X. Williams, 2 male paratypes; same place, Apr. 12, 1923, F. X. Williams, 1 male and 1 female paratypes.

Peru: Prov. La Mar. Sivia, Dept. Ayacucho, June 16-20, 1941, F. Woytkowski, 1 male; Santa Elena Roqueron, Padro Abad., Dept. Loreto, Aug. 8, 1946, F. Woytkowski, 1 female; Satipo, July, 1942, P. Paprzycki, 1 female; 11 km. NE. Tingo María, "Loc. Shapajilla", Dept. Huánuco, May 9, 1939, F. Woytkowski, 1 male.

Chile: Santiago,* Nov., 1949, L. E. Peña, 1 female.

Comparative Notes: In general appearance, quite similar to G. amazonensis Melin, G. bufo (Herrich-Schäffer), and to some extent G. vincinus Champion. It is larger than the latter species, not as slender as G. amazonensis Melin, and does not have the lateral margin of the pronotum as straight as is the case in G. bufo (Herrich-Schäffer). It may be separated from all three by the shape of the genital capsule of the male.

---

*See footnote under Distributional Data of G. flavus (Guérin-Méneville).

Gelastocoris viridis n. sp.

(Pl. IV, fig. 4; Pl. V, fig. 5; Pl. VI, fig. 8)

Probably referring to this species:

1901. Gelastocoris flavus (Guérin-Méneville); Champion Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 349.

Size. Male: Length, 6.6 to 6.8 mm.; width of pronotum, 4.1 to 4.2 mm.; width of abdomen, 4.4 to 4.5 mm. Female: Length, 6.9 to 7.8 mm.; width of pronotum, 4.0 to 4.7 mm.; width of abdomen, 4.7 to 5.2 mm.

Color. In general appearance from light brown to dark greyish-brown. Usually with the lateral portions of the pronotum lighter than the disc. Colors present are black, brown, yellow, orange, red, green and white. The blister-like granules are green in all but one specimen. In this specimen they are white. Below, mostly dark, especially the abdomen, which is dark brown. The legs are lighter, ringed with dark brown, dorsal surface suffused with red.

Structural Characteristics. Apex of head rounded; front moderately rough; ocelli extremely small, scarcely visible, one-third width of largest blister-like granules of the hemelytra in size. Pronotum with the disc rather rough; lateral margin of pronotum subparallel for a distance equal to one and one-fourth times the ocellocular space, diverging slightly posteriorly, then extending postero-laterad to lateral angle; postero-lateral margin with anterior half convex, posterior half concave; lateral angle projecting

laterad beyond base of embolium; width of pronotum slightly less than width of abdomen; base of pronotum lacking short, longitudinal carinae. Hemelytra extending to or beyond the end of the abdomen; membrane is slightly reduced; basal half of lateral margin of embolium expanded, width of expansion equal to one-third the ocellocular space, expansion posteriorly not angulate, rounding into margin of posterior portion of embolium. Connexivum completely covered or nearly so by the hemelytra in the males, more expanded and visible in the females. Blister-like granules of the hemelytra and of the other parts very large, numerous, one and one-half the width of base of hind tarsus in size. Spatulate right side of seventh ventral abdominal segment of male about one-half covered by preceding segment; not extending to lateral margin of abdomen; left side only slightly projecting posteriorly. Female ventral abdominal segments nearly symmetrical, incision of posterior margin of last segment broad, symmetrical or slightly bent to left. Keel hood of male genitalia triangular, covering apex, fringe transverse, hairs of fringe not very long; keel hook present, short, very stout, only slightly curved, not covering any portion of pan; pan wider than long, swollen into rather thick ridge around apex, basad of this is a deep transverse, crescent-shaped depression; tumescence of right clasper not adnate to basal portion of clasper; right clasper hook nearly sickle-shaped, moderately long, thin and with a very slight lateral projection at the middle; anterolateral projection of keel absent.

Location of Type. Holotype male, allotype female and one male paratype, Mt. Obando Queit, Chiapas, Mexico, Apr. 15, 1940, H. M. Smith; 1 male and 3 female paratypes, El Salto Escuintla, Guatemala, 1934, F. X. Williams in the Francis Huntington Snow Entomological Collection at the University of Kansas.

Distributional Data. As given above.

Comparative Notes. This small species resembles G. flavus (Guérin-Méneville) somewhat in external appearance, but it may be readily separated from this species by comparing the male genitalia. G. viridis does not have the keel hook recurved completely back over the base of the pan and the tumescence of the right clasper is not adnate to the basal portion of the clasper. This species may be separated from the other species by the shape of the pan, size of the blister-like granules of the hemelytra and by the shape of the lateral margin of the pronotum.

Gelastocoris angulatus (Melin)

(Pl. IV, fig. 3; Pl. V, figs. 7, 10)

1929. Montandonius angulatus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 169, figs. 32, 33.

Also referring to this species:

1929. Gelastocoris flavus (Guérin-Méneville); Martin, Univ. Kansas Sci. Bull., Vol. XVIII, No. 4, p. 364, Pl. 58, fig. 18, Pl. 59, fig. 7.

Size. Male: Length, 7.5 to 8.8 mm.; width of pronotum, 4.7 to 5.4 mm.; width of abdomen, 4.8 to 5.7 mm. Female: Length, 8.1 to 10.6 mm.; width of pronotum, 5.2 to 6.2 mm.; width of abdomen, 5.0 to 6.5 mm.

Color. Yellowish-brown to dark reddish-brown, usually more or less concolorous. Scutellum a little darker than rest of body, one specimen also has disc of pronotum darker than remainder of body. In most of the specimens examined, there are small black spots along the lateral margins of the pronotum and the expanded basal portion of the embolium. The connexivum has the segments darker along the bases. The large blister-like and peg-like granules are yellowish-brown, brown, reddish-brown or black. Legs faintly or darkly ringed with brown depending upon the coloration of the specimen as a whole.

Structural Characteristics. Apex of head slightly concave or straight; front very rough; ocelli small, two-fifths width of largest blister-like granules of the hemelytra in size, located on small tubercles between the eyes.

Pronotum with the disc rough; lateral margin of pronotum, nearly straight, usually faintly concave; lateral angle when present very obtuse, usually this portion of the pronotum is more or less rounded; projecting laterad beyond base of embolium; base of pronotum provided with six to eight short, longitudinal carinae. Hemelytra extending to or beyond end of abdomen, in males, usually shorter than abdomen in females, one small female has the hemelytra extending well beyond the end of the abdomen; membrane varies in size, but it is rather reduced in most specimens, the small female has a very well-developed membrane; basal half of lateral margin of embolium greatly expanded, width of expansion equal to one-half ocellocular space, expansion posteriorly not angulate, rounded, expansion as a whole rectangular. Connexivum, broad, extending from expansion of embolium all around hemelytra in females, quite visible in males. Large granules of hemelytra and other parts more elevated, peg-like, numerous, largest granules oval, about two times as long as width of base of hind tarsus. Spatulate right side of seventh ventral abdominal segment of male elongate, extending to lateral margin of abdomen; hardly covered by preceding segment; left side greatly projecting posteriorly. Female ventral abdominal segments nearly symmetrical, the incision of the posterior margin of last segment broad, and bent slightly to the left. Keel hood of male genitalia on the left side of keel, greatly reduced, fringe with hairs extremely long and extending from right side, around apex

and down left side of keel; keel hook absent; pan extremely large, rather oval in shape, as wide as shaft of keel level with right clasper hook; right clasper hook very characteristic, extremely long, shaped more or less like an S made backwards; tumescence of right clasper not adnate to base of right clasper, devoid of black peg-like spines; antero-lateral projection of keel absent.

Location of Type. In the British Museum, London, England.

Distributional Data. This species was described by Malin from specimens from Brazil. The writer has examined specimens from the following localities:

Bolivia: Coroico, no date, purchased from Dr. Staudinger, 1 male; Santa Cruz, no date, J. Steinbach, 1 male.

Brazil: Chapada, Aug., no collector, 1 male; same place, July, no collector, 1 male; same place, May, no collector, 1 male; same place, June, no collector, 1 female, (AMNH); same place, July, no collector, 1 male, (AMNH); same place, Aug., no collector, 2 males and 1 female, (AMNH).

Paraguay: "Caravene", Jan. 12, 1925, F. Schade, 1 female; "Koliuasque, Dept. Caruga", Dec., 1925, F. Schade, 1 female; "Villarrica, Cerro pelado", Jan. 28, 1929, F. Schade, 1 male; same place, Nov. 28, 1929, F. Schade, 1 female; "Serro Pelado, Cordill de la Villarrica", Dec., 1926, F. Schade, 1 female; "Villarrica", Mar., 1926, F. Schade, 1 female.

Comparative Notes. Differing considerably from all

other species. In shape of the lateral margin of the pronotum, rather similar to G. bufo (Herrich-Schäffer), but with the lateral angle rounded and not angulate as in the latter species. The 6 to 8 short, longitudinal carinae on the base of the pronotum; straight or concave margin of the apex of the head; peg-like nature of the granules of the hemelytra, etc.; wide expansion of the basal half of the embolial margin; and the male genitalia make the identification of this species a simple matter.

Gelastocoris apureensis Melin

1929. Gelastocoris apurensis Melin, Zoologiska Bidrag Uppsala, Band 12, p. 159, fig. 13.

Original description:

"Front of caput somewhat rough, between ocelli a small knoblike protuberance, laterally slightly sinuated, and apically rounded; fringe usually stout, of medial length. Structure of pronotum fairly marked; side without distinctly flattened margin, level with transversal furrow, projecting to an almost right, somewhat rounded angle, anterior part of edge slightly angularly bent, in front somewhat crenulated; posterior part somewhat dentated; anterior corner fairly stout, posterior one not very prominent; posterior margin of pronotum fairly deeply sinuated before scutellum. Membrane fairly narrow (exposing a broad connexivum) with fairly big granules, terminally not very hyaline; embolium, laterally, narrowly shelved. Mesosternal process short, broad, dentated. The 6th abdominal sternite of female slightly restricted.

"Coloration, greyish-brown; legs indistinctly ringed.

"Length 6.5, breadth 4 mm.

"Museum of Paris 3 sp. (types): 1?, 2 f. S. Fernando de Apure, Venezuela (Maindron).

"This species somewhat resembles G. amazonensis but with the exception of a smaller size may be distinguished

by the side of the pronotum lacking a distinctly flattened margin and the process being less prominent. The nature of apical incision of the 6th abdominal segment of female could not be observed on collected specimens."

The writer has not seen the type specimens and has in the collections before him only two specimens from Venezuela. These two specimens, one male and one female, seem to agree fairly closely with the original description of G. apureensis Melin, but the genitalia of the male shows that it is definitely G. flavus (Guérin-Méneville). Since the size and the shape of the lateral angle of the pronotum are quite variable in the latter species, it is the opinion of the writer that Melin's species will probably prove to be a synonym of G. flavus (Guérin-Méneville). For the present, however, it seems best to retain this species until the types can be examined.

NERTHRINAE KIRKALDY

Gelastocorids with the rostrum appearing to arise from the ventral surface of the head, not especially stout, apical portion often projecting anteriorly. Anterior leg with the tarsus fused to the tibia, not articulate, with only one well-developed tarsal claw in adults. Ninth ventral abdominal segment of the male quite visible externally, not completely invaginated within body cavity; the posterior process only slightly modified, right clasper greatly developed and folded longitudinally to act as a guide to the simple, tubular aedeagus; in the normal position, right clasper resting in a depression of the right side of the dorsal surface of the abdomen; left clasper absent. Ventral abdominal segments of female asymmetrical or asymmetrical, depending upon the species.

The Genus Nerthra Say

1832. Say, T., Heteropterus Hemiptera of North America, New Harmony, Indiana, p. 37. (stygica only species).

1859. Leconte, J. L., "Complete Writings of Thomas Say", Vol. I, p. 364.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 179.

1898. Kirkaldy, G. W., Entomologist, Vol. XXXI, p. 2.

1905. Torre-Bueno, J. R. de la, Ohio Nat., Vol. V, p. 287.

1906. Kirkaldy, G. W., Trans. Am. Ent. Soc., Vol. XXXII, p. 150.

1909. Kirkaldy, G. W. and Torre-Bueno, J. R. de la, Proc. Ent. Soc. Washington, Vol. X, p. 182.

1925. Blatchley, W. S., Ent. News, Vol. 36, pp. 49-52.

References to this genus under Mononyx Laporte:

1833. Laporte, F. L. de, Essai d'une Classification Systématique de L'order des Hémiptères, p. 16.

1835. Burmeister, H. C. C., Handbuch der Entomologie, Bd. 2, Abteil. 1, p. 201.

1836. Brullé, G. A., Histoire Naturelle des Insectes, Bd. 9, pp. 274-275.

1840. Spinola, M. M., Essai sur les Insectes Hémiptères, p. 63.

1840. Blanchard, E., Histoire Naturelle des Animaux Articules, Bd. 3, p. 93.

1843. Amyot, C. J. B. and Serville, A., Histoire Naturelle des Insectes. Hémiptères, p. 425.

1850. Spinola, M. M., Tavola sinattica dei generi spettanti alla classi degli Insetti arthrodignati Hemiptera, 25, 1, p. 49.

1851. Fieber, F. X., Genera Hydrocoridum secundum ordinem naturalem in familias dis posita. in: Sep. Pragae, Calve, 4, p. 12.

1861. Stål, C., Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 18, p. 201.

1863. Stål, C., Berlin Entomologische Zeitschrift, Vol. XXIV, p. 405.

1865. Stål, C., Hemiptera Africana, Vol. III, p. 171.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 138.

1884. Uhler, P. R., Standard Natural History, Vol. II, p. 264.

1899. Montandon, A. L., Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 4 et 5, p. 392.

1901. Champion, G. C., Biologia Centrali-Americaca, Rhynchota Heteroptera, Vol. II, p. 350.

1906. Distant, W. L., Fauna British India, Rhynchota, Vol. III, p. 14.

1906. Kirkaldy, G. W., Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

1909. Kirkaldy, G. W. and Torre-Bueno, J. R. de la, Proc. Ent. Soc. Washington, Vol. X, p. 181.

1917. Van Duzee, E. P., Cat. Hemiptera, Univ. California Publ., pp. 473-474.

1925. Blatchley, W. S., Ent. News, Vol. 36, pp. 49-52.

1929. Melin, D., Zoologiska Bidrag Fran Uppsala, Band 12, pp. 171-194.

References to this genus under Phintius Stål:

1861. Stål, C., Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 18, p. 201.

1867. Stål, C., Berlin Entomologische Zeitschrift, Vol. XXIV, p. 407.

1865. Stål, C., Hemiptera Africana, Vol. III, p. 172.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 139.

1929. Melin, D., Zoologiska Bidrag Fran Uppsala, Band 12, pp. 192-193.

References to this genus under Matinus Stål:

1861. Stål, C., Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 18, p. 201.

1867. Stål, C., Berlin Entomologische Zeitschrift, Vol. XXIV, p. 407.

1865. Stål, C., Hemiptera Africana, Vol. III, p. 172.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 139.

1900. Montandon, A. L., Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 1-7.

References to this genus under Peltopterus Guérin-Méneville:

1843. Guérin-Méneville, F. E., Revue Zoologique Travaux Inedits, p. 113. (as subgenus of Mononyx Laporte)

1865. Stål, C., Hemiptera Africana, Vol. III, p. 173.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens, Handlingar, Band 14, No. 4, p. 140.

1900. Montandon, A. L., Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 8-9.

References to this genus under Scylaecus Stål:

1861. Stål, C., Ofversigt af Kongl. Vetenskaps-Akademiens. Forhandlingar, Arg. 18, p. 201.

1865. Stål, C., Hemiptera Africana, Vol. III, p. 173.

1876. Stål, C., Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 139.

References to this genus under Glossoaspis Blatchley:

1925. Blatchley, W. S., Ent. News, Vol. 36, pp. 49-52.

Small to large bugs; usually of some shade of brown, nearly concolorous in most species. Front of head usually provided with tooth-like tubercles; ocelli usually present, but absent in some species; rostrum appearing to arise from the ventral surface of the head, not stout, apical portion projecting ventrally or anteriorly. Anterior leg with the tarsus fused to the tibia, not articulate, with only one well developed tarsal claw in the adults. Ninth abdominal segment of the male quite visible externally, not completely invaginated within the body cavity; the posterior process only slightly modified; right clasper greatly developed and folded longitudinally as a guide to the simple, tubular aedeagus; in the normal position, right

clasper resting in a depression of the right side of the dorsal surface of the abdomen; left clasper absent. Ventral abdominal segments of female either symmetrical or asymmetrical. Hemelytra usually with well-developed membrane, but membrane reduced or entirely lacking in some species; hemelytra fused together in some, but usually separate.

Formerly the species of this genus were placed in six genera, namely, Nerthra, Mononyx, Phintius, Matinus, Peltopterus and Glossoaspis. The number of species in each was 1, 31, 1, 6, 3, and 1 respectively. The genus Phintius was placed in synonomy with Mononyx by Montandon in 1899. Melin, 1929, raised this name back to generic status for a questionable species from Mexico. The only difference between Phintius and Mononyx is in the dilation of the middle of the lateral margin of the embolium. Melin gives several other differences, but none of them is of any value when all the species of the subfamily are studied. Mononyx had the hemelytra separate with well-developed membranes. Nerthra had the membrane lacking and the hemelytra fused together. Matinus had the membrane reduced. (Matinus americanus Montandon, actually has hemelytra entirely coriaceous and fused, and ocelli are absent). Peltopterus had the membrane lacking, hemelytra fused together, scutellum slightly reduced, and although not mentioned, the ocelli are absent. Glossoaspis was characterized in the same manner as Peltopterus. A

recent comparison of a specimen of Glossoaspis brunnea Blatchley and a type of Peltopterus rugosus (Desjardins) has proved that these two are identical.

Since brachypterous forms occur rather commonly in closely related families, it seems impractical to consider reduction of membrane and fusion of hemelytra as generic characters, especially when it is quite apparent that in most cases these characters have developed independently in each of the species possessing them.

Ordinarily the presence or absence of ocelli would seem to be a rather good character, but the loss of ocelli also has apparently occurred independently. This writer has found that six species lack ocelli. They all have the hemelytra entirely coriaceous and fused together, but when the structure of the head, the ventral abdominal segments of both male and female, and the male claspers are studied it can be shown that they are more closely related to other forms occurring in the areas where they are found than they are to each other.

In view of the lack of good generic characters, there does not seem to be justification for the division of the Nerthrinae into more than one genus. It was the hope of the writer that Mononyx Laporte could be retained as the generic name; however, Nerthra Say has priority and must be used.

KEY TO THE SPECIES OF NERTHRA*

1. Hemelytra with membrane reduced or entirely coriaceous..... 2

   Hemelytra with membrane well-developed.....13

2. (1) Ocelli present..... 8

   Ocelli absent..... 3

3. (2) Lateral margin of hemelytron from nodal furrow to apex, bent up almost at a right angle to rest of hemelytron.....N. hirsuta n. sp. (p. 154)

   Lateral margin of hemelytron not bentuup as above..... 4

4. (3) Apex and lateral margins of head provided with sharp-pointed tubercles; scutellum with a group of black bristles on lateral portions... 5

   Apex and lateral margins of head lacking sharp-pointed tubercles; scutellum lacking groups of bristles on lateral portions..... 6

5. (4) Large species, over 8 mm.; last three ventral abdominal segments of male small, right side of seventh ventral abdominal segment spatulate, partially covered by preceding segment; clasper of male simple, sickle-shaped; bristles spineline...N. williamsi n. sp. (p. 142)

   Smaller species, under 8 mm.; last three ventral abdominal segments of male rather large, right side of seventh ventral abdominal segment entirely covered by preceding segment; clasper of the male with a large process on the left side; bristles clavate .....N. americana (Montandon) (p. 139)

6. (4) Hemelytra with large longitudinal carinae..... 7

   Hemelytra without such carinae, nearly smooth, with a broad rounded elevation in the middle of each hemelytron, this elevation usually covered with a group of bristles..... .....N. rugosa (Desjardins) (p. 145)

* Does not include N. elongata (Montandon), (p. 135); N. turgidula (Distant), (p. 167); N. serrata (Montandon), (p. 172); N. annulipes (Horvath), (p. 196); N. planifrons (Melin), (p. 246).

7. (6) Pronotum widest at posterior angle; posterior angle of pronotum acute; tubercles on front of head very large, densely covered with short, clavate bristles.....
.....N. macrothorax (Montrouzier)
(p. 149)

Pronotum widest at middle of lateral margin; posterior angle obtuse; tubercles on front of head rather small, not densely covered with bristles; longitudinal carinae of hemelytra very prominent.....N. nervosa (Montandon)
(p. 152

8. (2) Membrane limited to a very narrow strip extending along inner margin from apex of hemelytron to scutellum.....N. sinuosa n. sp.

Membrane lacking, hemelytron entirely coriaceous..... 9

9. (8) Hemelytra fused together.....N. stygica Say
(p. 119)

Hemelytra separate, not fused together.....10

10. (9) Apex and lateral margin of head with five large tooth-like tubercles; base of scutellum medially, strongly depressed; hemelytra, scutellum and pronotum with groups of jet black, rather large, clavate bristles.....
.....N. grandis (Montandon)
(p. 133)

Apex and lateral margin of head lacking tooth-like tubercles or if present, very small; base of scutellum not strongly depressed; hemelytra, scutellum and pronotum lacking groups of large, black, clavate bristles.....11

11. (10) Posterior angle of pronotum angulate.....12

Posterior angle of pronotum rounded, not angulate.....N. alaticollis (Stål)
(p. 123)

12. (11) Lateral margin of head with large tubercle directly below inner margin of eye; apex of head depressed, base of depression wider than distance between ocelli.....
.....N. adspersa (Stål)
(p. 127)

Lateral margin of head lacking a large tubercle below the inner margin of eye; apex of head depressed, base of depression less in width than distance between ocelli.....
.....N. stali (Montandon)
(p. 130)

13. (1) Basal half of embolium expanded laterally (except N. asiaticus Horvath); anal flaps of female quite distinctly projecting posteriorly beyond rest of abdomen.....14

Basal half of embolium not expanded; anal flaps of female usually not projecting posteriorly beyond rest of abdomen.....17

14. (13) Mesosternal elevation apically greatly expanded laterally, two times as wide as width of mid-femur, apex depressed in middle, directed anteriorly as a shelf.....
.....N. grandicollis (Germar)
(p. 156)

Mesosternal process apically not very expanded laterally, about as wide as width of mid-femur, apex convex, not directed anteriorly as a shelf.....15

15. (14) Embolium not expanded laterally; females large over 10.5 mm.; lateral edge of pronotum more or less rounded.....N. asiatica (Horvath)
(p. 175)

Embolium expanded laterally; females medium-sized, not over 10.5 mm.; lateral edge of pronotum with several sinuosities.....16

16. (15) Anal flaps of female strongly lobed and projecting posteriorly beyond rest of abdomen; expansion of embolium more or less triangular, very salient; clasper of male with right side of base of swollen apical half broadly angulate; last ventral abdominal segment of female with lateral, submarginal tumescences .....N. lobata (Montandon) (p. 169)

Anal flaps of female slightly projecting posteriorly beyond rest of abdomen; expansion of embolium more elongated, but not so salient; clasper of male with right side of base of swollen apical half more or less rounded; last ventral abdominal segment of female without lateral, submarginal tumescences.....N. indica (Atkinson) (p. 164)

17. (13) Females with posterior margin of last ventral abdominal segment conspicuously emarginated; anal flaps completely exposed, fitting in the emargination; males with the greatest width of posterior margin of sixth ventral abdominal segment (measured from one caudolateral angle to the other) subequal to or greater than one-half the width of the fourth ventral abdominal segment (measured along the posterior margin, from the median notch to the lateral margin of the right side) [except N. nepaeformis (Fabricius)].....29

Females with posterior margin of last ventral abdominal segment not emarginate, usually more or less projecting posteriorly, anal flaps usually only slightly exposed or entirely covered by last ventral abdominal segment; males with width of the posterior margin of sixth ventral abdominal segment less than one-half the width of the posterior margin of the fourth ventral abdominal segment (except N. spissa (Distant), where it is subequal).....18

18. (17) Front of head with rows of white tubercles forming an inverted V..... .....N. tuberculata (Montandon) (p. 208)

Front of head without such white tubercles.....19

19. (18) Apex of head without tooth-like tubercles.....20

Apex of head with tooth-like tubercles present..21

20. (19) Head entirely lacking tooth-like tubercles....
.....N. nudata n. sp.
(p. 194)

Head with two small, broad, superapical, tooth-like tubercles present..N. spissa (Distant)
(p. 178)

21. (19) Antero-lateral and lateral margins of pronotum concave....N. laticollis (Guérin-Méneville)
(p. 180)

Not with both antero-lateral and lateral margins concave.....22

22. (21) Pronotum distinctly wider than greatest width of abdomen, abdomen less than 90% of width of pronotum.....N. mixta (Montandon)
(p. 185)

Pronotum about equal to or only slightly wider than abdomen, abdomen more than 90% of width of pronotum.....23

23. (22) Basal portion of lateral margin of embolium convex; front femora usually suffused with red.....N. femoralis (Montandon)
(p. 190)

Basal portion of lateral margin of embolium more or less concave; front femora not suffused with red.....24

24. (23) Small species, under 9 mm.; basal portion of lateral margin of embolium very slightly concave or straight; last ventral abdominal segment of female with the posterior margin angularly projecting on each side of apex, which is slightly concave; clasper of male with basal portion of apical half broadly expanded, flattened dorso-ventrally, small under 2.5 mm.....
.....N. luteovaria (Distant)
(p. 206)

Larger species, over 9 mm.; basal portion of lateral margin of embolium concave; last ventral abdominal segment of female with posterior margin laterad of apex more or less rounded; clasper of male not as above, not flattened dorso-ventrally, either with apical half of clasper expanded or clasper with the apical half not expanded.....25

25. (24) Clasper of male with the greatest portion of apical half greatly expanded.....26

Clasper of male not greatly expanded apically...28

*26. (25) Clasper with the dilation laterally angularly projecting, forming almost a right angle.....N. robusta n. sp. (p. 204)

Clasper with the dilation laterally not angularly projecting, more or less lobed, concavely depressed basad of the broadest part of the dilation.....27

27. (26) Clasper large, over 4 mm. in length; lobe on right side very prominent, constricted at base.....N. macrostyla n. sp. (p. 201)

Clasper smaller, under 3 mm. in length, indistinctly lobed, lobe not constricted at base.....N. ampliata (Montandon) (p. 198)

28. (25) Lateral margin of embolium strongly concave at basal third; clasper nearly straight, bent laterad at apex.....N. omani n. sp. (p. 188)

Lateral margin of embolium not as concave at basal third; clasper more or less curved, not distinctly bent laterad at apex..... ....N. gurneyi n. sp. (p. 183)

29. (17) Edge of anterior dilation of front femur nearly forming a right angle with posterior side of femur.....30

Edge of anterior dilation of front femur forming an acute angle with posterior side of femur.....31

---

*The writer also has been unable to find key characters for females of N. robusta n. sp., N. macrostyla n. sp., N. ampliata (Montandon), N. omani n. sp., and N. gurneyi n. sp. For the present it is necessary to use distribution, size and association with male to identify these females. Fortunately, these are insular species and may be separated on distributional data in most cases.

30. (29) Anterior basal angle of anterior dilation of front femur more or less rounded; last abdominal segment of female ventrally with a tumescence on either side of the emargination of posterior margin...N. raptoria (Fabricius) (p. 212)

Anterior basal angle of anterior dilation of front femur pointed; last abdominal segment of female ventrally without a tumescence on either side of emargination of posterior margin.....N. buenoi n. sp. (p. 210)

31. (29) Eighth abdominal segment of male venter equal to or less than length of ninth abdominal segment; anal flaps of female longer than wide.....32

Eighth abdominal segment of male venter at least twice as long as ninth abdominal segment; anal flaps of female small, as wide as or wider than long.....54

32. (31) Prominent patches of black bristles on scutellum.....33

Without such patches of black bristles on scutellum.....37

33. (32) Bristles on scutellum in narrow longitudinal bands.....34

Bristles not in narrow longitudinal bands, usually in rather oval patches.....36

34. (33) Posterior part of abdomen strongly dilated laterally.....35

Posterior part of abdomen not sgrongly dilated laterally.....N. unicornis (Melin) (p. 238)

35. (34) Bristles of scutellum short, clavate..... .....N. montandoni (Melin) (p. 243)

Bristles of scutellum long, scarcely or not at all clavate..... N. peruviana (Montandon) (p. 240)

36. (33) Apex of the head concavely excavated.....
.....N. ranina (Herrich-Schäffer)
(p. 216)

Apex of the head rather pointedly projecting; tubercles at the apex fused basally...
.....N. unicornis (Melin)
(p. 238)

37. (32) Apex of head pointedly projecting, terminating in one or more apical tubercles.....38

Apex of head not projecting pointedly, rather concavely excavated.....42

38. (37) Superapical tubercles present.....49

Superapical tubercles absent.....39

39. (38) Last abdominal segment of male very large, approximately two-fifths as wide as fifth abdominal segment; last ventral abdominal segment of female with anterior part of emargination forming an acute angle.....40

Last ventral abdominal segment of male smaller, about one-fourth as wide as fifth abdominal segment; last ventral abdominal segment of female with anterior part of emargination rounded..41

40. (39) Sides of pronotum at the level of the transverse furrow distinctly projecting beyond the base of embolium; sides noticeably converging anteriorly.....N. patula n. n.
(p. 227)

Sides of pronotum at the level of the transverse furrow very slightly projecting beyond base of embolium; sides more or less parallel.....N. borealis (Melin)
(p. 231)

41. (39) Basal third of embolium dilated, edge rounded; body flattened; greatest width of seventh ventral abdominal segment of the male less than one-half the width of the posterior margin of the fourth segment.....N. nepaeformis (Fabricius)
(p. 222)

Basal third of embolijm narrowed, not rounded, usually slightly sinuous; body not so flattened; greatest width of seventh ventral abdominal segment of male about equal to one-half the width of the posterior margin of the fourth segment.....
.....N. tenebrosa n. n.
(p. 233)

42. (37) Males.....43

Females.....47

43. (42) Apical half of clasper sword or sickle-shaped, more or less simple.....44

Apical half of clasper not as above.....45

44. (43) Sides of pronotum rounded and projecting.. .....N. ranina (Herrich-Schäffer) (p. 216)

Sides of pronotum straight, slightly sinuous.....N. parvula (Signoret) (p. 236)

45. (43) Apical part of clasper bifurcate, processes of approximate equal size and pointed..... .....N. amplicollis (Stål) (p. 248

Not conspicuously bifurcate, but with a dorso-medial process, this process much smaller than apical portion of clasper... 46

46. (45) Dorso-medial process, oval, flattened in tangential plane to longitudinal axis of clasper.....N. ater (Melin) (p. 255)

Dorso-medial process, cylindrical or sometimes flattened in radial plane to longitudinal axis of clasper...N. ecuadorensis (Melin) (p. 252)

47. (42) Emargination of last abdominal segment continuing as a long curved groove to the right, forming a distinct lobe or flap..... .....N. ranina (Herrich-Schäffer) (p. 216)

Emargination not as above.....48

48. (47) Anterior end of left anal flap twisted to the right and covering the anterior end of the right anal flap.....N. rudis (Melin) (p. 257)

Anterior end of left anal flap not twisted to cover anterior end of right anal flap.. N. amplicollis (Stål) (p. 248) and N. ecuadorensis (Melin) (p. 252)

49. (38) Males.....50

Females.....51

50. (49) Clasper swollen, slight processes on the lateral and dorsal surfaces.....N. martini n. sp. (p. 267)

Clasper swollen, a prominent process on the dorso-medial surface.....N. mexicana (Melin) (p. 264)

51. (49) Last ventral abdominal segment of female without obvious depressions or tumescences, nearly symmetrical.....N. lata (Montandon) (p. 259)

Last ventral abdominal segment with obvious depressions or tumescences or both, asymmetrical..52

52. Head with two apical tubercles.....53

Head with only one or without apical tubercles.....N. quinquedentata (Melin) (p. 261)

53. Last ventral abdominal segment more or less pointedly emarginated.....N. martini n. sp. (p. 267)

Last ventral abdominal segment with a rounded emargination.....N. mexicana (Melin) (p. 264)

*54. Eighth ventral abdominal segment of male over one-half as wide as fifth abdominal segment.....N. hungerfordi n. sp. (p. 282)

Eighth ventral abdominal segment of male about one-half as wide as fifth ventral abdominal segment.....55

55. Clasper with two projections on the medial surface.....N. fuscipes (Guérin-Méneville) (p. 272)

Clasper with one projection on the medial surface.....56

---

*The writer has been unable to find a character for separating the females of the last four species in this key. Until such a character or characters are discovered, one must use distribution, size, and association with the males to determine the species of these females.

56. Medio-basal angle of projection rounded .....N. bracchialis n. sp. (p. 286)

Medio-basal angle of projection deeply sinuated.....N. manni n. sp. (p. 278)

Nerthra stygica Say

(Pl. XII, fig. 7; Pl. XIII, fig. 1;
Pl. XIV, fig. 4)

1832. Nerthra stygica Say, Heteropterous Hemiptera of North America, New Harmony, Indiana, p. 37.

1859. N. stygica Say; Leconte, Complete Writings of Thomas Say, Vol. I, p. 364.

1876. N. stygica Say; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 139.

1905. N. stygica Say; Torre-Bueno, Ohio Nat., Vol. V, p. 288, figs. 1, 2.

1906. N. stygica Say; Kirkaldy, Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

1914. N. stygica Say; Barber, Bull. Am. Mus. Nat. Hist., Vol. XXXIII, p. 498.

1917. N. stygica Say; Van Duzee, Catalogue of Hemiptera, Univ. California Pub., Vol. I, p. 474.

1925. N. stygica Say; Blatchley, Ent. News, Vol. 36, pp. 49-52.

Also referring to this species:

1863. Mononyx stygica (Say); Stål, Berliner Entomologische Zeitschrift, Vol. VII, p. 406.

1886. M. stygica (Say); Uhler, Check List of Hemiptera-Heteroptera of North America, p. 27.

Size. Male: Length, 6.1 to 6.6 mm., width of pronotum, 4.4 mm., width of abdomen, 4.4 to 4.5 mm. Female: Length, 7.3 to 7.8 mm., width of pronotum, 5.0 to 5.2 mm., width of abdomen, 5.2 to 5.4 mm.

Color. Above; yellowish-brown to dark brown or even black, usually with the anterior two-thirds of each segment of the connexivum, the scutellum, the disc of the

pronotum and the head, darker. Below; forelegs dark brown, others lighter, femora ringed with two brown bands; abdomen brown, postero-lateral area of each segment yellowish-brown, median portion of abdomen with a U-shaped series of yellow or yellowish-brown spots.

Structural Characteristics. Front of head projecting, apex with small, rather sharp-pointed tubercles, superapical tubercles present, broad, not sharp-pointed, a lateral toothlike tubercle present between the superapical tubercle and the eye, the lateral tubercle small, irregular in shape; ocelli present, rather small, often difficult to locate in light colored specimens. Lateral margins of pronotum nearly straight but slightly convergent anteriorly, anterior one-fourth more abruptly converging; postero-lateral margin rounded; posterior margin nearly straight, slightly sinuous before scutellum; pronotum widest at transverse furrow, equal to or slightly less than abdomen in width; disc elevated, lateral expansions nearly flat. Scutellum moderately large, flat, depressed at base and inclined to apex which is slightly elevated. Hemelytra entirely coriaceous, fused together, extending posteriorly as far as end of abdomen; basal half of embolium expanded laterally, nearly as wide as pronotum. Connexivum expanded, but more so in the female than the male. Bristles moderately long, usually dark brown or black, clavate, those on the hemelytra arranged to some extent in faint rows following or

paralleling the sutures. Ventral abdominal segments asymmetrical; posterior margin of last segment deeply and triangularly emarginate, keeled, keel anteriorly running obliquely to the right, a small submarginal tumescence on the right side, a larger tumescence to the left side, also a very prominent depression antero-laterad of the left side of the emargination. Nearly identical in the shape of the ventral abdominal segments to N. martini n. sp. or N. mexicana (Melin). Ventral abdominal segments of male asymmetrical; ninth segment oval, wider than long, 32:15, fairly large, about one-fourth width of abdomen, subequal in length to eighth segment, but longer than seventh. Clasper of male very similar to that of the N. mexicana (Melin) and N. martini n. sp. Apical half swollen slightly and slightly recurved. Apex narrowed, rather abruptly into short process which curves in toward the middle of the body, a projection arising from the dorso-medial surface at the base of the swollen portion of the clasper.

Location of Type. Unknown. Some of Say's types are supposedly in the collection of the Philadelphia Academy of Science, Philadelphia, Pennsylvania.

Distributional Data. This species is known from Florida and Georgia. The writer has studied specimens from the following localities in Florida:

Capon, Apr. 18, no collector, 1 female, (USNM);

Ch. Hbr. (Charlotte Harbor?), no date, Mrs. A. T. Slosson, 1 female, (AMNH); Dunedin, March 20, 1923, W. S. Blatchley, 1 female, (Purdue Coll.); same place, Feb. 21, 1926, W. S. Blatchley, 1 female, (Purdue Coll.); Enterprise, May 13, no collector, 1 male, (USNM); Fort Myers, Nov. 15, 1911, no collector, 1 male and 1 female, (AMNH); Jacksonville, no date, Ashmead, 1 female; Pensacola, Oct. 11-14, 1914, no collector, 1 female, (AMNH).

Comparative Notes. This species is quite close to N. mexicana (Melin) and N. martini n. sp. It differs from these two in that the hemelytra are entirely coriaceous and fused together. If this form had normal wings it would be quite difficult to separate it from the two previously mentioned species. The pronotum is slightly different also, but this may be due to the brachypterous condition. This species can be separated from N. americana (Montandon) and N. williamsi n. sp., which also have entirely coriaceous and united hemelytra, by the presence of ocelli, shape of the ventral abdominal segments of the female, and by the male clasper.

Nerthra alaticollis (Stål)

(Pl. XII, fig. 11; Pl. XIII, fig. 2;
Pl. XIV, fig. 1)

1854. Mononyx alaticollis Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 11, p. 2[illegible]9.

1861. Matinus alaticollis (Stål); Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 18, p. 201.

1863. M. alaticollis (Stål); Stål, Berliner Entomologische Zeitschrift, VII, p. 407.

1876. M. alaticollis (Stål); Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 1[illegible]9.

1900. M. alaticollis (Stål); Montandon, Bulletin de la Societé des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 4-5.

1906. M. alaticollis (Stål); Kirkaldy, Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

Size. Male: Length, 6.7 to 7.[illegible] mm., width of pronotum, 5.0 to 5.5 mm., width of abdomen, 5.0 to 5.6 mm. Female: Length, 7.4 to 8.5 mm., width of pronotum, 5.5 to 6.4 mm., width of abdomen, 5.2 to 6.[illegible] mm.

Color. Quite variable, but in general, grey to light brown in over-all appearance. Ground color runs from light yellow to black. Disc of pronotum, scutellum, and head usually darker than rest of body; in some these parts are black while the hemelytra and lateral expansions of the pronotum are light yellow. Front of head may have apical half orange or white or may be entirely black. Anterior margin of front femora, bases and apices of middle and hind femora may be almost white. The ventral

abdominal segments generally dark reddish-brown with the spiracles and area immediately surrounding the spiracles lighter. The lateral margins of the embolium and the pronotum with alternating dark brown and yellow spots in most specimens.

Structural Characteristics. Head with five rather small, sharp-pointed tubercles, apical tubercle not visible from above; front rather flat; ocelli present. Pronotum widest at the middle; lateral margin more or less rounded, median half nearly straight in some specimens; disc elevated and pitted with many small, irregular depressions; posterior margin trisinuate. Scutellum slightly elevated; small to moderate lateral tubercle at middle of each side, a small pit-like depression postero-mesad of these; apex may or may not be elevated. Hemelytra usually extending to or beyond end of abdomen; bluntly pointed apically; membrane absent, hemelytra entirely coriaceous, not fused; embolium extremely expanded apically. Connexivum variable in degree of expansion, broadly expanded in some, not so much so in others. Hemelytra and scutellum nearly glabrous, lacking black, clavate bristles. Ventral abdominal segments of female nearly symmetrical; projecting posteriorly and almost completely covering the anal flaps; posterior margin of last segment projecting posteriorly laterad of apex which is slightly concave. Ventral abdominal segments of male with last three

segments small, less than one-half the width of the posterior margin of the fourth segment; ninth segment oval, slightly wider than long, longer than eighth segment; eighth longer than seventh. Clasper of male sickle-shaped, slightly swollen basally, apex slender, slightly recurved.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. This species is known only from Australia. The writer has seen specimens from the following localities:

Brisbane, June 11, 1915, Bridwell, 1 male and 1 female, (USNM); same place, no date, H. Hacker, 1 female; Caloundra, Oct. 10, 1912, no collector, 1 female; Leura, N. S. Wales, no date, W. M. Mann, 1 female, (MCZH); Megalong Vy., Blue Mts., N. S. Wales, Jan. 20, 1932, Darlington, 1 female, (MCZH); Moreton Bay, Stradbroke1, Queensland, Sept. 20, 1915, J. C. Bridwell, 1 female, (USNM); N. S. Wales, no date, Hy. Edwards Collection, 1 female; same place, no date, same collector, 1 female, (AMNH); Weathcote, N. S. Wales, Dec. 7, 1914, C. T. Brues, 1 female, (MCZH); Wentworth Falls, N. S. Wales, Dec. 29, 1931, W. M. Wheeler, 1 male, (MCZH).

Comparative Notes. This species is most closely related to Nerthra adspersa (Stål) and N. stali (Montandon). It may be separated from both by the

shape of the lateral margin of the pronotum. It is the opinion of the writer that when males of N. stali (Montandon) are available for study, the clasper may be very similar to that of N. alaticollis (Stål).

Nerthra adspersa (Stål)

(Pl. XIII, fig. 6)

1863. Matinus adspersus Stål, Berliner Entomologische Zeitschrift, VII, p. 407.

1876. M. adspersus Stål; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 139.

1900. M. adspersus Stål; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, p. 5.

Size. Length, 6.0 mm., width of pronotum, 5.2 mm., width of abdomen, 5.2 mm. This specimen has had the posterior portion of abdomen eaten by dermestids, and this makes the determination of sex impossible, in view of present knowledge.

Color. Pale reddish-brown, almost pink. Scutellum and maculations on margins of hemelytra and pronotum darker, the former with a reddish cast, the latter brown. Lateral tubercles and apex of head nearly white. Below, with abdominal segments dark brown with large light yellow areas along the lateral margin of each segment. Front femora dark reddish-brown, tibiae lighter.

Structural Characteristics. Head lacking sharp-pointed tubercles, a large blunt tubercle on the lateral margin immediately below the inner margin of the eye; front quite flat; vertex nearly transverse, scarcely convex; apex of head depressed, base of depression wider than distance between ocelli. Pronotum greatly

expanded laterally, widest at a point just anterior of the humeral angle; lateral margin with posterior two-thirds subparallel, gradually converging anteriorly, anterior one-third abruptly converging toward the eye; posterior margin trisinuate. Scutellum weakly elevated, lacking prominent elevations; a shallow depression present at the middle on either side of the median line. Hemelytra very broad, completely covering abdomen, membrane apparently lacking, but as this portion is slightly damaged also it is not possible to say definitely; embolium greatly expanded laterally.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Stål described this species from specimens from Western Australia. The specimen studied by this worker is also from Western Australia, Kirkaldy Collection, which is now owned by the University of Kansas.

Comparative Notes. This species is closely related to N. alaticollis (Stål) and N. stali (Montandon). It can be separated from the former by the shape of the pronotum and from the latter by the large lateral tubercles of the head and by the fact that the base of the depression of the apex of the head is wider than the distance between ocelli. Montandon examined one of the types and mentions that the tubercles of the head are

quite visible, especially the lateral tubercles which are located below each eye. The length of the type was also slightly smaller than the specimen before the writer, measuring 5.5 mm.

Nerthra stali (Montandon)

(Pl. XIII, fig. 9; Pl. XIV, fig. 7)

1900. Matinus stali Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 5-6.

Size. Female: Length, 7.7 to 8.1 mm., width of pronotum, 6.8 to 7.0 mm., width of abdomen 6.9 to 7.3 mm.

Color. Superficially appearing greyish-brown, ground color actually yellowish-brown and this is maculated with reddish-brown; head, disc of pronotum and connexivum slightly darker than rest of dorsum. Below; abdomen dark reddish-brown, except caudo-lateral portions of each segment which are yellow or yellowish-brown; legs brown with the trochanters, bases and apices of femora, and bases of tibiae, yellow.

Structural Characteristics. Head with five small tooth-like tubercles, apical one is ventrad and caudad of the others which are on anterior margins of head; front of head rather flat; ocelli present. Pronotum broadly expanded laterally; disk elevated, pitted; lateral margins of pronotum nearly straight for posterior two-thirds, but converging anteriorly, anterior third more abruptly converging toward the eye; posterior angle projecting beyond the base of the embolium, nearly forming a right angle; posterior margin of pronotum almost straight, very slightly concave before scutellum and a small projection even with the base of the claval

suture. Scutellum slightly elevated, especially near the middle of the lateral margins and at the apex. Hemelytra entirely coriaceous, not fused together, tapering apically to a blunt point, not quite extending to the end of the abdomen; embolium rather expanded laterad for its entire length. Connexivum broadly expanded, widest part of insect, but only slightly wider than hemelytra and pronotum. Ventral abdominal segments of female symmetrical; last segment projecting posteriorly, nearly covering anal flaps, not emarginate.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Montandon described this species from a female specimen from occidental Australia. The worker has studied the following specimens also from Western Australia:

Augusta, Febr., W. S. Brooks, 2 females, (MCZH); "Austral. occident.", no date or collector, 1 female, (Museum of Stockholm).

Comparative Notes. This species is most closely related to N. adspersus (Stål) and N. alaticollis (Stål). It may be separated from the former by the number and type of tooth-like tubercles on the head, by the pitting of the disc of the pronotum and by the shape of the base of the depression of the apex of the head. From the latter it may be separated by the shape of the lateral margin of the pronotum. It is the opinion of the

writer that when the biology of this species and N. alaticollis (Stål) is known, it may be that we shall discover they are the same species. Unfortunately the worker was not able to study males of this species, so comparisons of male genitalia could not be made.

Nerthra grandis (Montandon)

(Pl. XII, fig. 3; Pl. XIII, figs. 7, 10; Pl. XIV, fig. 3)

1900. Matinus grandis Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 6-7.

Size. Male: Length, 9.1 mm., width of pronotum, 6.5 mm., width of abdomen, 6.7 mm. Female: Length, 9.0 mm., width of pronotum 6.4 mm., width of abdomen, 6.7 mm.

Color. Almost uniformly dark reddish-brown, nearly black.

Structural Characteristics. Front of head with five rather large tooth-like tubercles, apical one ventrad and caudad of the others which are on the anterior margin of the head when viewed from above; ocelli present, but very small. Pronotum slightly less in width than abdomen; lateral margin with the posterior three-fifths slightly convex, nearly straight, anterior two-fifths converging toward the eye, straight; posterior margin trisinuate; transverse suture of disc crossed by three distinct longitudinal carinae. Scutellum depressed at the median basal portion, elevated at the apex and at the middle of each lateral margin, the three elevations connecting to one another. Hemelytra entirely coriaceous with the veins slightly elevated, extending as far as end of abdomen; embolium expanded laterally for its entire length. Connexivum

visible in both sexes, rather expanded laterad. Body covered black, clavate bristles which occur in clumps on the hemelytra, the scutellum and the pronotum. Ventral abdominal segments of the female symmetrical; last segment projecting posteriorly, covering the anal flaps. Last three ventral abdominal segments of male small, last segment about two times as wide as long, about equal in length to the eighth segment and one and one-half times as long as the seventh, ninth segment only about one-fifth as wide as fourth segment. Clasper of the male simple, sickle-shaped, rather wide at base and tapering gradually to apex which is recurved.

Location of Type. In the Museum of Paris, Paris, France.

Distributional Data. The specimens Montandon described were from Australia. The writer has examined a pair of this species labeled, "Victoria", no date, P. R. Uhler Colln., (USNM).

Comparative Notes. The above specimens were determined by Montandon as this species in 1909. It is most closely related to N. femoralis (Montandon), but may be distinguished from that species by the entirely coriaceous hemelytra, by the absence of red on the anterior femora and by the shape of the clasper of the male. Montandon's description states that the membrane is reduced, but the two specimens examined by this worker had the hemelytra entirely coriaceous.

Nerthra elongata (Montandon)

1900. Matinus elongatus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, p. 7.

The writer has not seen any specimens which agree with Montandon's description of this species. Original description:

"Forme allongée, teinte brunâtre obscure assez uniforme sur tout le corps. Tête ruguleuse, subarrondie en avant, sans tubercules dentiformes apparents ni sur le bord externe, ni sur la surface.

Pronotum à cotés latéraux peu dilatés, subparallèles sur les deux tiers postérieurs, assez largement arrondis antérieurement, l'angle postérieur étroitement arrondi, bord postérieur presque droit, très obtusément subsinué devant l'écusson et très faiblement obliqué lateralement de chaque coté. Rides et sillons du pronotum peu accentués, très obtus.

Ecusson à peine un peu plus long que large.

Elytres très obtusément arrondies au bord externe, sans aucune sinuosité sur la marge, recouvrant entièrement le connexivum et dépassant faiblement l'extrémité de l'abdomen; membrane à peu près nulle, presque indistincte, à peine valvante.

Dessous du corps assez uniformément brunâtre, plus clair sur la poitrine près des hanches. Pattes

brunâtres, plus claires avec trois grandes taches flaves mal limitées sur la partie inférieure des fémurs intermédiaires et postérieurs, la partie supérieure de ces fémurs, regardant le corps au repos, presque entièrement flave. Les fémurs antérieurs assez dilatés, bruns en dessous, presque entièrement flaves à leur partie supérieure.

Tubercule du mesosternum pas très élevé, étroit dès la base et obtus au sommet.

Dernier segment de l'abdomen ♀ largement tronqué à l'extrémité, laissant apercevoir une très faible portion des pièces génitales. Avant dernier segment abdominal non ou imperceptiblement rétréci au milieu. Australie (Fischer 1878) exemplaire unique. K. K. Hof Museum Vienne."

Nerthra sinuosa n. sp.
(Pl. XIV, figs. 5, 8)

Size. Female: Length, 7.5 to 7.8 mm., width of pronotum, 4.8 to 5.2 mm., width of abdomen, 5.0 to 5.4 mm.

Color. Light brown or yellowish-brown, darker on disc of pronotum, base of scutellum and scattered areas on the ventral abdominal segments.

Structural Characteristics. Head with four fairly small, marginal tooth-like tubercles; ocelli present. Pronotum widest at a point level with the transverse furrow, but only slightly wider than angle at anterior one-fourth of lateral margin, lateral margin between these two points strongly concave; antero- and postero-lateral margins slightly concave, converging mesad; posterior margin trisinuate. Scutellum rather flat, a moderately large tumescence on each side at middle of margin, apex slightly elevated. Hemelytra rather pointed apically; membrane reduced to a narrow strip extending from apex along inner margin toward scutellum; extending beyond the end of the abdomen; embolium not very expanded. Connexivum completely covered by hemelytra. Ventral abdominal segments of female more or less symmetrical, last segment with the apex produced, almost completely hiding anal flaps, rather broadly keeled, extreme apex very faintly emarginate.

Location of Type. Holotype female, Dorrigo, N. S. Wales, Australia, no date, W. Heron in the Museum of Comparative Zoology at Harvard University. One female paratype, same data, in the Francis Huntington Snow Entomological Collection at the University of Kansas.

Distributional Data. As given for the type series.

Comparative Notes. This species seems to be close to N. laticollis (Guérin-Méneville) on the basis of the lateral margin of the pronotum, but it has the membrane of the hemelytra reduced and is somewhat lighter in color than the latter species.

Nerthra americana (Montandon)

(Pl. XII, fig. 12; Pl. XIII, fig. 4)

1905. Matinus americanus Montandon, Annales Musei Nationalis Hungarici, Vol. III, pp. 404-405.

1906. M. americanus Montandon; Torre-Bueno, Proc. Ent. Soc. Washington, Vol. VIII, Nos. 1 and 2, p. 51.

1931. M. americanus Montandon; Carlo, J. A. de and Gemignani, E. V., Revista de la Sociedad Entomologica Argentina, Vol. 3, No. 6, pp. 329-330.

Size. Male: Length, 6.3 to 6.6 mm., width of pronotum, 4.3 to 4.4 mm., width of abdomen, 4.4 mm. Female: Length, 6.6 to 7.1 mm., width of pronotum, 4.5 to 4.9 mm., width of abdomen, 4.6 to 5.1 mm.

Color. Above, yellowish-brown to brown, scutellum and disc of pronotum usually darker; basal two-thirds of each segment of the connexivum dark brown; hemelytra and lateral expanses of pronotum are sometimes spotted with dark brown. Below, legs light with dark brown rings, front femora irregularly spotted with brown; abdominal segments of female dark, but may be spotted with yellowish-brown; anal flaps of female and last two abdominal segments of the male, lighter than rest of abdominal segments.

Structural Characteristics. Apex of head pointedly projecting, anterior margin with numerous small, sharp-pointed tubercles; ocelli absent. Lateral margins of pronotum subparallel for the posterior two-thirds,

straight or very faintly concave and slightly converging anteriorly; antero-lateral margin converging abruptly toward the eye, rather concave; postero-lateral margin doubly concave; posterior margin nearly straight, with three broad, very shallow, concavities; disc elevated, lateral expanses nearly flat, slightly elevated medially next to disc; pronotum and abdomen subequal in width in males, abdomen slightly wider than pronotum in females. Scutellum not at all elevated, no higher than hemelytra and depressed slightly at base, the apex being the most elevated portion. Hemelytra usually extending as far as or beyond end of abdomen, entirely coriaceous and fused together; embolium with basal portion expanded laterally, and bent up for about one-half its length. Connexivum visible, more expanded laterally in females. Bristles of dorsal part of body, moderately long and clavate, those of the hemelytra darker than rest. Ventral abdominal segments of female nearly symmetrical; emargination of posterior margin of last segment nearly triangular, slightly rounded apically; anal flaps triangular, slightly longer than wide; caudo-lateral angles of last segment weakly projecting posteriorly. Last ventral abdominal segment of male oval, with oblique furrow from left to right, wider than long, 33:19, longer than seventh or eighth segments; right side of seventh segment completely covered by the sixth segment.

Clasper of male distinctive, sickle-shaped, but with a large thumb-like projection arising on the dorso-lateral surface.

Location of Type. Unknown. It may be in the National Museum of Hungary at Budapest, some of the specimens before the author at the time of the description were from this museum. The rest of the specimens were from Montandon's own collection, but Dr. H. B. Hungerford did not find this type in the British or Paris Museums.

Distributional Data. Montandon's specimens were from Espírito Santo, Brazil. Specimens studied by this worker are from São Paulo, Brazil, no date, Mraz. Lgt., 2 males and 13 females. The specimens belong to the Museum of Prague, Prague, Czechoslovakia. A male and female from this series has been retained and are now in the Francis Huntington Snow Entomological Collection at the University of Kansas.

Comparative Notes. This species may be separated from N. williamsi n. sp. by the right side of the seventh ventral abdominal segment of the male being covered by the sixth segment, by the smaller size, by the presence of clavate bristles and by the shape of the clasper of the male. It can be separated from the other American species by the absence of ocelli, and by the entirely coriaceous hemelytra which are fused together.

Nerthra williamsi n. sp.

(Pl. XII, fig. 9)

Size. Male: Length, 8.0 to 8.6 mm., width of pronotum, 5.8 to 6.1 mm., width of abdomen, 5.7 to 6.0 mm. Female: Length, 9.1 to 9.6 mm., width of pronotum, 6.4 to 6.8 mm., width of abdomen, 7.0 to 7.1 mm.

Color. Above from light yellowish-brown to brown, base of scutellum, disc of pronotum, front of head, and antero-lateral angles of segments of connexivum, darker. Below, head dark, front legs mostly dark brown or black, irregularly marked with yellow and yellowish-brown, femora of middle and hind legs yellowish-brown, ringed with two bands of dark brown, abdominal segments brown to black, caudo-lateral angles of each segment lighter in color.

Structural Characteristics. Front of head with sharp-pointed tubercles, apical ones ventrad and slightly caudad of others, the latter, of which there are about five on each side, are irregular as to size and position, usually along the antero-lateral margin of the head. Apical tubercles variable as to number and size, usually one large median apical tubercle; ocelli absent. Width of pronotum about equal to width of abdomen in males, less than width of abdomen in females; lateral margin of pronotum nearly straight, barely concave, for the posterior three-fourths of the margin

of the pronotum, abruptly but roundly converging to the eye anteriorly, postero-lateral margin rounded; posterior margin of pronotum relatively straight, very weakly concave before scutellum, slight convexities before the basal angles of the scutellum and before base of embolial suture of hemelytron; disc elevated, lateral expanses of pronotum nearly flat. Scutellum, not especially elevated, except at apex; base sunken, inclined posteriorly to apex. Hemelytra entirely coriaceous, fused together. Connexivum expanded laterally in both sexes, wider than embolium, but more so in females. Body covered with slender, brown or black bristles which are slightly curved near apex, pointed, not at all clavate. Ventral abdominal segment of female with last segment fairly deeply emarginated, apex of emargingation more or less rounded; segments nearly symmetrical; anal flaps rather large, triangular, slightly longer than wide and each with a rather deep depression. Last ventral abdominal segment of male small, oval, wider than long, 20:11, about equal to or a little longer than eighth segment, longer than seventh segment. Spatulate right side of seventh ventral abdominal segment, elongate and narrowed. Clasper of male sickle-shaped, quite similar to the clasper of N. peruviana (Montandon) and N. nepaeformis (Fabricius).

Location of Type. Holotype male, allotype female and 3 male and 3 female paratypes, São Paulo, Brazil,

no date, Mraz Lgt., in the Museum of Prague, Prague, Czechoslovakia. One male and one female paratypes, same data, in the Francis Huntington Snow Entomological Collections at the University of Kansas.

Distributional Data. As given for type series.

Comparative Notes. This form is closely related to N. americana (Montandon), if one considers the hemelytra it may be separated from this species by the clasper of the male being simple, without a large process on the left side, bristles not clavate, right side of seventh ventral abdominal segment of male not covered completely by sixth segment and by the presence of non-clavate bristles. It is the opinion of the writer, that this species is actually closely related to N. peruviana (Montandon) as is indicated by the similarities of head, pronotum, abdominal segments, male claspers, non-clavate bristles, etc. It may be distinguished from the latter species by the fused, entirely coriaceous hemelytra and absence of ocelli.

This species is named in honor of F. X. Williams, who has collected considerable material in this family from various regions of the world.

Nerthra rugosa (Desjardins)

(Pl. XIII, fig. 5)

1837. Naucoris rugosa Desjardins, Annals Société Entomologique de France, 6, p. 239.

1837. N. rugosa Desjardins; Serville, Annals Société Entomologique de France, 7, p. 243.

1840. N. rugosa Desjardins; Westwood, Introduction to the Modern Classification of Insects, 2, p. 464.

1843. Peltopterus rugosus (Desjardins); Guérin-Méneville, Revue Zoologique Travaux Inedits, pp. 112-113.

1863. P. rugosus (Desjardins); Stål, Berliner Entomologische Zeitschrift, VII, p. 407.

1865. P. rugosus (Desjardins); Stål, Hemiptera Africana, III, p. 173.

1876. P. rugosus (Desjardins); Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 140.

1900. P. rugosus (Desjardins); Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, p. 9.

1906. P. rugosa (Desjardins); Kirkaldy, Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

Also referring to this species:

1925. Glossoaspis brunnea Blatchley, Ent. News, Vol. 36, pp. 49-52.

Possibly referring to this species:

1884. Mononyx stygicus Uhler, Standard Natural History, Vol. II, p. 264, nec Say.

1902. Nerthra stygica Say; Howard, The Insect Book, pl. XXXIX, fig. 16.

Size. Female: Length, 6.0 to 7.1 mm., width of pronotum, 4.1 to 5.0 mm., width of abdomen, 4.2 to 5.1 mm.

Color. Above; head, disc of pronotum and hemelytra, brown, lateral expansions of pronotum, apical half of the scutellum and apical halves of the segments of the connexivum, yellowish-brown, the lateral portions of the pronotum may have some darker maculations. Below; legs brown; abdomen brown with the caudo-lateral portions of the segments paler, yellow or yellowish-brown.

Structural Characteristics. Front of head with three rounded elevations, apex smooth, rounded, lacking tubercles; ocelli absent. Lateral margins of pronotum subparallel for posterior two-thirds, slightly rounded, anterior third roundly converging toward the eyes; posterior angle rounded, not at all projecting beyond base of embolium; posterior margin of pronotum trisinuate before the scutellum. Scutellum rather small, apex rather elongate, tongue-shaped, apex and basal angles slightly elevated, meso-basal portion depressed. Hemelytra entirely coriaceous, fused together, extending to or beyond end of abdomen, smooth, with not a trace of longitudinal carinae, but with a basal and medial tumescence on each hemelytron; embolium greatly expanded laterally at the basal one-third, expansion widest posteriorly and rather abruptly narrowing at that point. Connexivum visible, variable as to the degree of expansion. Bristles variable in shape, most of the body with short clavate bristles, elevations with much longer clavate bristles which are very slender at the

base. Ventral abdominal segments of the female symmetrical; last segment not emarginate, but not covering the anal flaps, usually slightly but broadly keeled. The trochanters of the anterior legs have two apical tubercles in all the specimens examined.

Location of Type. In the Museum of Paris, Paris, France.

Distributional Data. This small species has the greatest and undoubtedly the most peculiar distribution of all the members of this family. The type was described from "Isle of Maurice" (Mauritius), which is in the Indian Ocean. Blatchley reported it from Florida (as Glossoaspis brunnea). The writer has seen specimens from the following localities:

Florida. Arch Cr., Mar. 21, 1911, W. S. Blatchley, 2 females, one the type of Glossoaspis brunnea Blatchley, (Purdue Coll.); Biscayne, Apr. 5, 1887, Heidemann, 1 female; Matecumba Key, Mar. 14, 1947, R. H. Beamer, 1 female.

Panama. San José Is., Pearl Is., Mar. 1, 1944, J. P. E. Morrison, 1 female, (USNM).

Comparative Notes. A comparaison by Doctor Eugene Seguy of the specimen from Matecumba Key, Florida has shown that Glossoaspis brunnea Blatchley is a synonym of Peltopterus rugosus (Desjardins). This species may be separated from the other species, which have the

hemelytra entirely coriaceous and fused together and which also have the ocelli absent, in the following ways: From N. macrothorax (Montrouzier) and N. nervosa (Montandon) by the absence of longitudinal carinae on the hemelytra. From N. williamsi n. sp. and N. americana (Montandon) by the tubercles of the head and the shape of the last ventral abdominal segment of the abdomen. From N. hirsuta n. sp. by the nature of the edges of the hemelytra.

Nerthra macrothorax (Montrouzier)

(Pl. XII, fig. 10; Pl. XIII, fig. 3; Pl. XIV, fig. 9)

1855. Galgulus macrothorax Montrouzier, Annales des Sciences Physiques et Naturelles, d'Agriculture et d'Industrie, Lyon., Vol. 2, pp. 110-111.

1863. Peltopterus macrothorax (Montrouzier); Stål, Berliner Entomologische Zeitschrift, Vol. VII, p. 407.

1870. P. macrothorax (Montrouzier); Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Forhandlingar, No. 7, p. 706.

1880. P. macrothorax (Montrouzier); Distant, Trans. Ent. Soc. London, pt. IV., p. 486.

1900. P. macrothorax (Montrouzier); Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 6, p. 8.

1906. P. macrothorax (Montrouzier); Kirkaldy, Trans. Am. Ent. Soc., Vol. XXXII, p. 149.

Also referring to this species:

1861. Syclaecus macrothorax (Montrouzier); Stål, Ofversigt af. Kongl. Vetenskaps-Akademiens Forhandlingar, Arg. 18, p. 201.

1865. S. macrothorax (Montrouzier); Stål, Hemiptera Africana, III, p. 173.

1876. S. macrothorax (Montrouzier); Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 139.

Size. Male: Length, 7.9 mm., width of pronotum, 5.9 mm., width of abdomen, 6.0 mm. Female: Length, 9.2 to 10.6 mm., width of pronotum, 6.8 to 8.2 mm., width of abdomen, 6.7 to 8.2 mm.

Color. Above, light brown; the basal portions of the segments of the connexivum, the carinae of the

hemelytra and the disc of the pronotum a little darker. Below, brown with a tinge of red.

Structural Characteristics. Front of head provided with five large, rounded tubercles four of which are flattened on top and densely covered with short clavate bristles; ocelli absent. Pronotum greatly expanded laterally; lateral margins converging anteriorly, subparallel for posterior one-half; posterior angle projecting obliquely postero-laterad, rather pointed; posterior margin with five concavities. Scutellum, rather small, apex narrowed, basal portion depressed, inclining to apex which is most elevated. Hemelytra entirely coriaceous, fused together, extending slightly beyond end of abdomen, large longitudinal carinae present; base of embolium greatly expanded laterad. Connexivum broadly expanded laterally in both sexes. Entire body covered with short, broadly clavate bristles, bristles pale and especially dense on pronotum and on the elevations of the head. Ventral abdominal segment of female nearly symmetrical except for posterior margin of last segment, which is slightly emarginated, but with apex slightly convex just below the anal flaps, the latter somewhat rounded and the left one over-lapping the right. Ventral abdominal segments of male rather small, last segment wider than long, 32:17, nearly twice as long as eighth segment, which has the right side

elongate, spatulate. Clasper of male rather sickle-shaped, but nearly straight, very slightly enlarged at apex (apical third) then tapering to a blunt point.

Location of Type. In the Museum of Paris, Paris, France.

Distributional Data. This species has been reported from the following places in the East Indies and the Pacific: Philippines, Aru Island, N. Borneo, Woodlark Island, Solomon Arch., and the Marriannes. The writer has examined specimens from the following localities:

New Guinea: Goodenough I., Aligabay Cr., Aug. 1, 1943, B. E. Rees, 1 female, (USNM); Maffin Bay, Dutch N. Guinea, July 1, 1944, E. S. Ross, 1 female, (CAS); same place, May 25, 1944, E. S. Ross, 1 female, (CAS).

Philippines: N. W. Panay, no date, Baker, 1 female, (USNM); Biliran Isl., no date or collector, 1 female, (USNM).

Solomons: Florida Island, Mar. 11, 1945, J. R. Stuntz, 1 male.

Comparative Notes. The size, shape of the pronotum, longitudinal carinae and clasper of the male will separate this species from all the others. It is quite closely related to N. nervosa (Montandon), but differs in the shape of the pronotum.

Nerthra nervosa (Montandon)

(Pl. XIII, fig. 8)

1900. Peltopterus nervosus Montandon, Bulletin de la Societé des Sciences de Bucarest-Roumanie, An. VIII, No. 6, pp. 8-9.

Size. Female: Length, 8.1 mm., width of pronotum, 5.7 mm., width of abdomen, 6.0 mm.

Color. Dark brown to reddish brown, more or less concolorous, but with the disc of the pronotum, the carinae of the hemelytra, and the scutellum very slightly darker.

Structural Characteristics. Front of head with round, flattened tubercles which are densely covered with short clavate bristles; ocelli absent. Lateral margins of the pronotum rounded; pronotum widest at the middle; disc elevated, lateral expansions nearly flat; posterior margin of the pronotum nearly straight, not at all concave before scutellum; pronotum less than abdomen in width. Scutellum rather small, apex narrowed, basal portion depressed, inclining to apex which is the most elevated portion. Hemelytra entirely coriaceous, fused together, extending beyond end of abdomen, longitudinal carinae very large and conspicuous; base of embolium greatly expanded laterally, exceeding or equal to width of pronotum. Connexivum broadly expanded laterally. Bristles of body short and clavate. Ventral abdominal segments of female nearly

symmetrical; posterior margin of last abdominal segment slightly emarginated, last segment not covering the anal flaps.

Location of Type. In the Museum of Paris, Paris, France.

Distributional Data. Montandon described this species from a single male form the Mariannes. This worker has studied a female "Guam, 1895", (USNM), that was determined by Montandon in 1909.

Comparative Notes. This species differs from N. macrothorax (Montrouzier) in the shape of the lateral margin of pronotum being more rounded, posterior margin nearly straight, smaller size, longitudinal carinae of the hemelytra being somewhat larger and the emargination of the posterior margin of the last ventral abdominal segment smaller. To the knowledge of the writer, Montandon did not designate this female as the allotype of the species, it may be that he designated some other specimen as the allotype, although I can find no reference to it in the literature. For this reason, it seems best to refrain from designating this specimen as the allotype, at least until more material from some of the European museums can be examined.

Nerthra hirsuta n. sp.

(Pl. XIV, fig. 6)

Size. Female: Length, 6.2 mm., width of pronotum, 4.4 mm., width of abdomen, 4.4 mm.

Color. Brown to dark reddish-brown above, below, darker, except trochanters, bases, and apices of femora of the middle and hind legs, and the postero-lateral angles of the ventral abdominal segments which are yellowish-brown.

Structural Characteristics. Head with four rather broad tooth-like tubercles; ocelli, if present, very small and indistinguishable from the granulation of the head. Lateral margins of pronotum subparallel, but slightly converging anteriorly; antero-lateral margin converging rather abruptly toward eye; postero-lateral margin rounded. Scutellum moderate in size, depressed basally and elevated laterally from middle to apex. Hemelytra parallel or nearly so for three-fifths their length, then converging posteriorly in a broad semicircle; hemelytra thick, entirely coriaceous, fused together and with the costal margins from apex of embolium to apex of hemelytron very distinctly bent up at about a 45 to 60 degree angle to rest of hemelytra, notched at apex and not bent up. Connexivum not visible. Entire upper surface and front of head provided with rather large broadly clavate

bristles which are mostly black in color and which are clumped together in spots on the hemelytra and on the elevations of the scutellum. The body as a whole is rather truncate in appearance. Ventral abdominal segments of the female similar to those of other species from the Australian region, last segment extending posteriorly and completely or nearly completely covering anal flaps, broadly keeled and slightly emarginate at apex.

Location of Type. Holotype female, West Australia, Augusta, Feb., W. S. Brooks, in the Museum of Comparative Zoology at Harvard University.

Distributional Data. As given above for the type.

Comparative Notes. This species may be separated from all others with entirely coriaceous and fused hemelytra, by the small size, by the turned-up edges of the hemelytra, and by the abundance of broad, clavate bristles on the dorsal surface and the head.

Nerthra grandicollis (Germar)

(Pl. XI, fig. 1)

1837. Mononyx grandicollis Germar, Silbermann's Revue Entomologique, V, p. 122.

1863. M. grandicollis Germar; Stål, Berliner Entomologische Zeitschrift, VII, p. 407.

1873. M. grandicollis Germar; Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 172.

1892. M. grandicollis Germar; Gerstaecker, Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten, Vol. IX, 2, p. 14.

1899. M. grandicollis Germar; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 396.

1899. M. grandicollis Germar; Horvath, Termeszetrajzi Fuzetek, XXII, p. 268.

1908. M. grandicollis Germar; Montandon, Herausgegeben von der Kongl. Schwedischen Akademie der Wissenschaften, p. 20.

1914. M. grandicollis Germar; Montandon, Insectes Hémiptères, II, p. 122.

1925. M. grandicollis Germar; Singh-Pruthi, Trans. Royal Ent. Soc. London, p. 184.

1926. M. grandicollis Germar; Jaczewski, Annalibus Zoologicis Musei Polonici Historiae Naturalis, T. V., zesz. 2, pp. 72-74.

1934. M. grandicollis Germar; Poisson, Bulletin de la Société des Zoologique de France, Tome LIX, No. 1, p. 97.

1940. M. grandicollis Germar; Poisson, Bulletin du Musée royal d'Histoire naturelle de Belqique, Tome XVI, No. 40, p. 13.

Also referring to this species:

1865. Phintius grandicollis (Germar); Stål, Hemiptera Africana, III, p. 172.

1876. P. grandicollis (Germar); Stål, Kongl, Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 139.

1892. P. grandicollis (Germar); Brancsik, Jahrbuche der naturqissenschaftlichen Vereines des Trencsiner Comitates, XV, p. 251.

1853. Mononyx sordidus Herrich-Schäffer, Die Wanzenartigen Insecten, IX, p. 26, fig. 893.

1860. M. sordidus Herrich-Schäffer; Signoret, Annales de la Société des Entomologique de France, p. 969.

1855. Mononyx limigenus Stål, Ofversigt af Kongliga Vetenskaps-Akademiens Fordhandlingar, XII, p. 46.

1858. Mononyx rotundicollis Signoret, in Thoms. Arch., 2, p. 329, fig. 628.

1929. Phintius stali Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 193, figs. 100-102, 106. (?)

Size. Male: Length, 7.5 to 9.3 mm.; width of pronotum, 5.5 to 6.3 mm.; width of abdomen, 5.5 to 6.3 mm. Female: Length, 8.2 to 10.4 mm.; width of pronotum, 6.4 to 7.5 mm.; width of abdomen, 6.0 to 7.8 mm.

Color. Variable, from light yellowish-brown to dark brown; connexivum with the posterior half of each segment yellowish-brown, anterior half darker; ventrally mostly dark brown, dilation of front femur, intermediate and hind femora and the abdominal segments either dark or spotted with yellowish-brown.

Structural Characteristics. Apex of the head more or less concavely excavated; four tubercles present, three on the frons and one on the apex, the latter is not visible from a dorsal view. Pronotum widest at a level with the transverse furrow, projecting beyond the base of the embolium;

lateral margins more or less rounded, converging anteriorly; posterior margin sinuated before scutellum, crossed by nine indistinct longitudinal carinations. Scutellum elevated, tumescent laterally and at the apex. Hemelytra extending to or beyond end of abdomen in the males, usually shorter than abdomen in the females; embolium strongly dilated from the base to the middle, lateral margin of the dilation nearly straight. Connexivum moderately visible in the males, very prominent in the females. Short clavate bristles in groups on the hemelytra, and especially prominent on the tumescence of the scutellum and the carinations of the pronotum. Front femur with anterior margin wavy with tooth-like microscopic spines. Ventral abdominal segments of the female asymmetrical; posterior margin of the last abdominal segment medially deeply notched. Anal flaps rather large, elongate, rounded posteriorly. Ventral abdominal segments of the male asymmetrical; ninth segment about as long as the eighth segment, twice as long as the seventh, slightly wider than long. Clasper of the male , twisted slightly mesad at apex, aedeagal furrow visible for the entire length of the dorsal surface.

Location of Type. Unknown. Germar's Hemipterous specimens are located in the Museum of Halle and Dahlem Museum in Germany and Museum of Lomberg in Poland. Doctor H. B. Hungerford visited the Dahlem Museum in Berlin in 1928, and did not find the type there.

Distributional Data. This species apparently is the only species of this family present in Africa, where it is found from east to west, south of the Sahara. It also occurs on Madagascar. The writer has studied specimens from the following localities:

Belgian Congo: Ava Kubi, Nov. 10-30, 1909, Lang and Chapin, 1 female, (AMNH); Faradje, Feb., 1911, Lang and Chapin, 1 male, (AMNH); same place, Mar., 1911, Lang and Chapin, 1 female, (AMNH); Garamba, May 3-11, 1912, Lang and Chapin, 1 female, (AMNH); same place, July, 1912, Lang and Chapin, 3 males, (AMNH); Kinda Katana, no date or collector, 1 female; Luebo, D. W. Snyder, no date, 2 females, (USNM); Medjie, May, 1914, Lang and Chapin, 1 male, (AMNH); Niangara, Nov., 1910, Lang and Chapin, 1 female, (AMNH); Parva, July, 1913, Lang and Chapin, 1 male, (AMNH); Panga, Sept., 1914, Lang and Chapin, 1 female, (AMNH); Stanleyville, Mar., 1915, Lang and Chapin, 2 males, (AMNH); same place, Aug. 7, 1909, Lang and Chapin, 1 female, (AMNH) same place, Sept. 5, 1909, Lang and Chapin, 1 female, (AMNH); Vankerckhovenville, April, 1912, Lang and Chapin, 1 female, (AMNH).

Cameroons: Batanga, Mar., 1914, F. H. Hope, 1 male and 1 female, (Car. Mus.); same place, April 1914, F. H. Hope, 1 male and 1 female, (Car. Mus.); same place, June 15, 1920, F. H. Hope, 1 female, (Car. Mus.); Metet, May 13, 1919, A. I. Good, 1 female (Car. Mus.); Victoria, no date or collector, 2 males and 1 female; Yaunde, no date or collector, 1

male, (Car. Mus.); "N. Kamerun, Johann-Albrechtshohe, L. Conradt, 96", 1 female, (USNM).

Ethiopia: Cheren, Erythraea, no date or collector, 1 male and 2 females.

French Equatorial Africa: Fort-Crampel, no date or collector, 2 females; Gabun, no date or collector, 1 male; Kangwe, no date or collector, 1 male; Lambarene, May, 1892, A. C. Good, 1 male, (Car. Mus.); Ogové (Ogowe?) River, no date or collector, 1 male, (Car. Mus.).

Kenya: Diani Dist., 20 mi. S. of Mombasa, Apr. 28, 1948, F. X. Williams, 1 female.

Liberia: Bendija, 1940, W. M. Mann, 1 male, (USNM); Bromley, 1940, W. M. Mann, 1 female, (USNM); Mombo, 1940, W. M. Mann, 1 female, (USNM); Mt. Coffee, Apr., 1897, R. P. Currie, 6 males and 2 females, (USNM); same place, 1897, Mrs. Sharp, 1 male, (USNM).

Mozambique: Delog. Bay (Delogoa Bay), no date or collector, 1 female, (USNM); Lowraulo Margues (Lourenço Margues), no date or collector, 1 male, (USNM).

Nigeria: Ibadan, Apr. 23-May 6, 1936, Van.Zwaluwenburg and McGough, 1 male, (USNM).

Portuguese Guinea: Borma, June to Dec., 1899, L. Fea, 2 females, (USNM).

Sierra Leone: "Sierra Leone," no date or collector, 1 male.

Tanganyika: Lindi, Apr., no collector, 1 male and 1 female; same place, no date or collector, 1 male.

Transvaal: Ugogo, no date or collector, 1 male; Zontpansberg, March, no collector, 1 female; "D. O. Afr., from Rolle," 1 male, (CAS).

Colony Unknown: "Nliosamque, Feb. 1, 1910, Howard Coll.", 1 male and 3 females, (USNM).

Madagascar: Diego-Suarez, 1893, Ch. Alluaud, 1 male, (M. Paris); Great Oriental Forest, no date or collector, 2 males; Maroantsetra, no date or collector, 2 males and 1 female; same place, no date or collector, 1 male and 2 females.

Comparative Notes: Most closely related to N. indica (Atkinson) from which it may be distinguished by the shape of the dilation of the embolium, more rectangular, by the shape of the clasper of the male, and of course by its peculiar distribution. It is the only species of this genus known from Africa.

Melin, 1929, re-established the genus Phintius Stål and described a new species from a single male specimen which is labeled "Mexico-Liebmann." He named this species Phintius stali. While it is not impossible, especially in consideration of the distribution of Nerthra rugosa (Desjardins), that a species closely related to Nerthra grandicollis (Germar) could occur in the New World, I personally feel that it is quite unlikely. It is my opinion that the label has been

changed on this specimen. Melin does not state how this specimen differs from N. grandicollis (Germar) and his drawings do not show any differences. For these reasons I am temporarily placing this species in the synonomy of N. grandicollis (Germar). In the event that an examination of the type proves that this is a good species, the name will have to be changed since it is a homonym of N. stali (Montandon) which was described much earlier. The original description of Phintius stali Melin follows:

"Edge of mouth with a toothlike process; front with strongly marked medial knob; medial processes fairly large, knoblike and pointed; lateral ones forming a dentated ridge. Structure of pronotum fairly strongly marked with prominent ridges at transversal furrow, but without stem of T-shaped part; side rounded, level with the furrow, fairly strongly projecting beyond base of embolium; anterior corner hook-shaped; posterior margin before scutellum broadly by not very deeply sinuated. Scutellum with traces of protuberances, apical knob very prominent. Processes of femora apically, obtuse-angled and rounded, anterior side wavy. Apical segment in male fairly small, not very much longer than preceding one. Bristles short, conspicuously clavate, densely grouped on sides of scutellum.

"Coloration brownish; abdomen ventrally, darkish-brown with posterior margin of anterior segments lighter; legs light brown; femora of 1st pair posteriorly, darker; other femora indistinctly ringed.

"Length 9, breadth 6 mm.

"Museum of Kobenhavn: 1 male, Mexico (Liebmann).

"As far as I know, no species of this genus has hitherto been found in the New World. For this reason I thought the label of the specimen might possibly have been changed, but I could not find the type in any paper."

Nerthra indica (Atkinson)

(Pl. XI, fig. 3)

1888. Mononyx indicus Atkinson, Journal of the Asiatic Society of Bengal, Vol. LVII, pt. 2, p. 345.

1899. M. indicus Atkinson; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 and 5, p. 397.

1906. M. indicus Atkinson; Distant, Fauna British India, Vol. III, p. 15.

1919. M. indicus Atkinson; Paiva, Records of the Indian Museum, Vol. XVI, pt. 5, No. 23, p. 372.

Also referring to this species:

1906. Mononyx projectus Distant, Fauna British India, Vol. V, p. 310.

Size. Male: Length, 8.4 to 9.1 mm.; width of pronotum, 5.5 to 6.7 mm.; width of abdomen, 5.7 to 6.2 mm. Female: Length, 9.7 to 9.9 mm.; width of pronotum, 7.0 to 7.3 mm.; width of abdomen, 7.2 mm.

Color. Light brown to dark reddish-black; segments of connexivum mostly uniform in color, occasionally with posterior half of each segment lighter. Legs generally light yellowish-brown, abdomen, except for marginal spots, darker.

Structural Characteristics. Front of head with four tubercles, three on the frons and one at the apex which is not visible from a dorsal view, the medial tubercle of the frons and the apical tubercle sometimes rather indistinct. Pronotum about as wide at anterior third as at the level with

the transverse furrow; lateral margins irregular in shape, usually sinuous, but variable even on the two sides of the same specimen; posterior margin sinuated before scutellum; posterior third of pronotum crossed by nine indistinct longitudinal carinations. Scutellum elevated, tumescent laterally and at apex, a curved ridge paralleling sinuosity of posterior margin of pronotum. Hemelytra extending beyond end of abdomen in the males, not quite reaching end of abdomen in the females; embolium narrow at base, dilated before middle, anterior portion and apex of dilation more or less rounded. Abdomen broadly dilated laterally in the female. Bristles mostly short and clavate, groups of long black bristles on basal tumescences and median part of pronotum. Ventral abdominal segments of female nearly symmetrical; last abdominal segment medially emarginated, flattened on either side of emargination. Anal flaps asymmetrical, slightly lobed and projecting posteriorly. Ventral abdominal segments of the male asymmetrical; ninth segment wider than long, not quite as long as eighth segment but longer than seventh. Male clasper similar to that of N. lobata (Montandon) but smaller, not as pointed apically.

Location of Type. Unknown. It apparently is not in the British Museum with the rest of Atkinson's specimens.

Distributional Data. This species is apparently restricted to India. This worker has seen specimens from the following localities:

Chabua, Assam, Aug. 2, 1943, D. E. Hardy, 1 male, (USNM); Himalaya, 1900, Tulis, 1 female; Kouy-Tcheon, Rég. de Pin-Fa, 1908, Père Cavalerie, 1 male, (Mus. Paris); Kurseong, no date, P. Blaet, 1 male, (USNM); Sandhira, Sylket, no date, Heidemann, 1 female.

Comparative Notes. Most closely related to N. lobata (Montandon) from which it may be separated by the male genitalia, by the smaller anal flaps which are less projecting and by the lack of lateral submarginal tumescences of the last ventral abdominal segment in the case of the females. In both sexes the lateral dilation of the embolial margin is not so triangular as in N. lobata.

A comparison of the male genitalia of the type of Mononyx projectus Distant has shown that this name is a synonym of N. indica (Atkinson).

Nerthra turgidula (Distant)

1906. Mononyx turgidulus Distant, Fauna British India, Vol. V, pp. 311-312.

The writer has not seen this species, or at least has not been able to recognize it.

Original description:

"Head, pronotum and scutellum more or less dark greyishly pubescent; hemelytra pitchy black; connexivum greenish ochraceous, with subquadrate piceous segmental spots; head between eyes about twice as broad as long, anterior margin shortly setose and with two short obscure spines at middle; eyes a little recurved, brownish ochraceous, above interiorly fuscous; pronotum with the anterior and posterior margins subequal in breadth, the lateral margins moderately, subtruncately produced, the anterior disk moderately gibbous, but not prominently nodulose, finely granulose as seen between the pubescence, transversely impressed at about one-third before basal margin, behind this impression longitudinally carinate, the most prominent carinations being six in number, the lateral areas are flatly ampliate, very much less pubescent and more ochraceous in hue, their margins shortly setose, prominently sinuate near anterior angles which are shortly obtusely spinous; scutellum with a short uprightly

setose elevation on each side near base, its apex somewhat prominently tuberculous; corium thickly, finely granulose; membrane not reaching abdominal apex; connexivum broad, the posterior angles of the segments moderately angulate, the segments also moderately foveately depressed; body beneath palely fuscously pubescent, the lateral areas of the prosternum more or less ochraceous; abdomen with a lateral fascia on each side united subapically, black in appearance caused by the absence of the paler pubescence; anterior legs fuscously pubescent, the tarsi castaneous at base and black at apex; intermediate and posterior legs more or less olivaceous, shortly setose.

"Length 9.5 millim.; breadth of pronotum 6.5 millim.

"Hab. Nepal; Gowchar (Coll. Dist.)"

This species may very easily be a synonym of N. indica (Atkinson), however, it is the opinion of the writer that the species should be retained until such time as the type may be studied and compared to the other species from India.

Nerthra lobata (Montandon)

(Pl. XI, fig. 2; Pl. XV, fig. 3)

1899. Mononyx lobatus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 397.

Size. Male: Length, 8.6 mm.; width of pronotum, 6.1 mm.; width of abdomen, 6.2 mm. Female: Length, 10.0 to 10.5 mm.; width of pronotum, 6.8 to 7.0 mm.; width of abdomen, 7.3 to 7.4 mm.

Color. Dorsally dark reddish-brown; segments of connexivum posteriorly yellowish-brown, sometimes entirely dark; front femur mostly dark, anterior dilation and area before apex yellowish-brown; intermediate and hind femora light with a dark brown ring; joint between tibia and femur of all legs black; lateral margins of the abdominal segments yellowish-brown at posterior half.

Structural Characteristics. Front of head more or less concavely excavated; a pair of large pointed tubercles on frons, eyes noticeably projecting. Pronotum widest at anterior third; lateral margin broadly sinuous, two sinuosities before and two behind anterior third; posterior margin sinuated before scutellum; posterior part of the disc of the pronotum crossed by nine indistinct longitudinal carinations. Scutellum moderate in size, elevated, a tumescence at each basal angle and at apex. Hemelytra short not reaching end of abdomen; embolium very narrow at base, suddenly dilated

laterally before middle, dilation more or less triangular. Abdomen very prominently dilated laterally. Anal flaps large, lobed and prominently projecting posteriorly. Bristles on body short and clavate, except those on scutellum which are rather elongate, not very clavate. Bristles on basal tumescences of scutellum very dense and black in color, those on the apex also dense, but light brown in color. Front femur with anterior margin irregular, covered with black tooth-like microscopic spines. Ventral abdominal segments of the female slightly asymmetrical, posterior margin notched medially with a slightly depressed area on each side, laterad of which is a moderate tumescence, the one on the left the larger. Ventral abdominal segments of the male asymmetrical; ninth segment rather oval, wider than long, slightly shorter than eighth segment; seventh segment about half as long as eighth segment; fifth segment very short medially. Male clasper swollen apically, bent mesad, tapering to fairly acute point at apex.

Location of Type. In the British Museum, at London, England.

Distributional Data. When Montandon described this species he had specimens from Sumatra and Java before him. All specimens examined by the writer have been from Sumatra. They are from the following localities:

Aek Coelangen, N. Harbisaran, Sept. 6, 1928, Meer Mohr, 1 male and 3 females; "Sumatra," no date, R. Weber, 1 female, (AMNH).

Comparative Notes. This species is mostly closely related to Nerthra indica (Atkinson) but differs from that species in that the abdomen of the female is wider, the anal flaps much more projecting posteriorly, lateral tumescences of the last ventral abdominal segment are present, in the males the clasper while quite similar is not dilated so abruptly as in N. indica (Atkinson) and is more sinuous apically and in both sexes the lateral dilation of the embolial margin is more triangular.

It may be that N. serrata (Montandon) will prove to be this species in which case Nerthra lobata (Montandon) would fall as a synonym since it was described two years after the former species. Doctor R. L. Usinger examined the clasper of the type of N. serrata (Montandon) and is of the opinion that it is the same as my drawing of the clasper of N. lobata (Montandon). Montandon's description of N. serrata states that the pronotum laterally is very dilated and that the segments of the connexivum are concave. None of the specimens I have examined are of this nature. For that reason and because both species were described by Montandon, this writer prefers to retain both species until more specimens can be examined. The original description of Nerthra serrata (Montandon) is given at another point in this work.

Nerthra serrata (Montandon)

1897. Mononyx serratus Montandon, Annals Musée Civique di St. Nat. Genova, I, p. 365.

1899. M. serratus Montandon; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 and 5, p. 396.

1906. M. serratus Montandon; Distant, Fauna British India, Vol. III, p. 15.

The writer has not seen this species or at least has not been able to recognize it.

Original description:

"2. Mononyx serratus nov. sp. -- Carin Chebà, Carin Ghecù. Collection du Musée Civique de Gênes, du Musée d'hist. Nat. de Hambourg et la mienne.

"Longueur 8.2 - 9.4 mill.; largeur max. pronotum 6 - 7 mill., abdominale 5.8 - 6.8 millimètres.

"Tête fortement tuberculeuse; en regardant l'insecte directement en dessus on apercoit très bien trois forts tubercules dentiformes en avant, les deux de la partie antérieure de la tête laissent entre eux une assez profonde échancrure au milieu de laquelle se présente le sommet du troisième dont la base est située un peu en arrière des premiers. Cotés latéraux de la tête faiblement sinués crénelés; partie superiéure raboteuse, inégale.

"Pronotum fortement élargi en demi cercle sur les cotés, le bord externe avec de petites sinuosités formant

des dents subarrondies, inégales; dépassant latéralement d'une facon très sensible le niveau du bord externe des elytres et de l'abdomen; l'angle antérieur dirigé presque droit en avant, plus ou moins saillant, parfois assez aigu, atteignant le niveau du milieu transversal de l'oeil.

"Ecusson assez bombé avec une petite carène longitudinale médiane et deux forts tubercules latéraux longitudinaux, un peu divergents en arrière, garnis d'épines dressées en brosse.

"Elytres finement granuleuses, fortement sinuées au bord externe, tout pres de la base, cette sinuosité suivie d'un assez fort lobe aplati, brusquement tronque en arriere au niveau du tiers basal de l'élytre; subarrondies ensuite sur les deux tiers postérieurs. Connexivum avec tous les segments légèrement sinues, surtout les trois derniers, les angles postérieurs un peu saillants et garnis d'une rangée de petites soies blanchâtres, courtes et raides.

"Tubercule du mesosternum en croix, tres atténué au sommet qui est légèrement arrondi, presque aigu. Fémurs jaunâtres pâles avec un anneau indécis, légèrement brunâtre un peu au delà du milieu, et l'extrême sommet étroitement noir brunâtre; tibias et tarses brunâtres, un peu plus clairs vers leur base et plus foncés, presque noirs vers leur extrémité.

"Pièce génitale ♂ assez large, faiblement rejetée sur la gauche. Pièce génitale ♀ un peu plus large que longue, s'enfoncant dans l'échancrure obtuse du dernier segment

abdominal; les deux parties de la pièce génitale subtronqués postérieurement avec leur angle externe peu saillant, subarrondi.

"La forme très dilatée du pronotum, le lobe de la marge élytrale et les sinuosités du connexivum permettront de reconnaître facilement cette espece."

A discussion of the possible relationship of this species with Nerthra lobata (Montandon) will be found in the comparative notes of that species.

Nerthra asiatica (Horvath)

(Pl. XIV, fig. 2)

1892. Mononyx asiaticus Horvath, Természetrajzi Füsetek, Vol. XV, pt. 3, p. 136.

1909. M. asiaticus Horvath; Oshanin, Verzeichnis der Palaearktischen Hemipteren, Vol. I, p. 956.

1912. M. asiaticus Horvath; Oshanin, Katalog der palãarktischen Hemipteren, p. 89.

1926. M. asiaticus Horvath; Kirit., "Konowia," Zeitschrift fur systematische Insektenkunde unter Mitwirkung fuhrender Entomologen, Vol. 5, No. 3, p. 226.

1930. M. asiaticus Horvath; Kirit., Annuaire du Musée Zoologique de l'Academie des Sciences de l'URSS, p. 435.

1933. M. asiaticus Horvath; Hoffmann, Lingnan Science Journal, Vol. 12, Suppl., p. 250.

1935. M. asiaticus Horvath; Wu, Catalogus Insectorum Sinensium, Vol. 2, p. 559.

1941. M. asiaticus Horvath; Hoffmann, Lingnan Science Journal, Vol. 20, No. 1, p. 44.

Also referring to this species:

1899. Mononyx grossus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 et 5, p. 398.

1906. M. grossus Montandon; Distant, Fauna British India, Vol. III, p. 16.

Size. Female: Length, 11.8 mm.; width of pronotum, 8.0 mm.; width of abdomen, 8.5 mm.

Color. Above, more or less uniformly brown, scutellum slightly darker than rest of dorsal surface. Below, mostly dark brown, a few patches of yellowish-brown about the bases of the middle and hind legs.

Structural Characteristics. Apex of head more or less rounded, apical tubercle absent, superapical and lateral tubercles small, irregular in shape, not sharp-pointed. Pronotum widest at transverse furrow, not quite as wide as abdomen; lateral margins parallel or nearly so, in median portion, anterior and posterior parts of the margin distinctly converging mesad; disc elevated and rather rough; posterior margin trisinuate. Scutellum elevated, apex slightly lobed, with tumescences at the middle of the lateral margins. Hemelytra not extending to the end of the abdomen, membrane well-developed; embolium with the basal-half of the lateral margin nearly straight or very slightly concave, not expanded laterad at middle. Connexivum greatly expanded laterally, wider than width of pronotum or hemelytra. Bristles in rows and clumps on hemelytra and in clumps on scutellum and pronotum, bristles short or moderately long, clavate, slightly curved. Ventral abdominal segments of female nearly symmetrical, anal flaps slightly projecting posteriorly; posterior margin of last ventral abdominal segment triangularly emarginate.

Location of Type. Unknown. Perhaps in the Museum of Budapest, although Doctor H. B. Hungerford does not mention it in the notes he made during his visit to this museum in 1928.

Distributional Data. This species has been reported from China, India and Tibet. The type is from Flumen Poi-ho,

China (G. N. Potanin). This worker has examined a paratype of Mononyx grossus Montandon. This specimen is labeled Thibet (Mou-Pin), 1969-1870, (A. David). It was sent in exchange from the Museum of Paris and is now in the Francis Huntington Snow Entomological Collection at the University of Kansas.

Comparative Notes. This species differs from N. indica (Atkinson) by the shape of the tubercles of the head, by the lateral margin of the pronotum and by the larger size. In the shape of the pronotum it would seem to be closely related to N. spissa (Distant), but the worker has not seen a female of the latter species or a male of N. asiatica (Horvath), so no definite comparison can be made between these two species at the present time.

Nerthra spissa (Distant)

(Pl. XI, fig. 6)

1906. Mononyx spissus Distant, Fauna British India, Vol. V, p. 313.

Size. Male: Length, 8.5 mm.; width of pronotum, 6.0 mm.; width of abdomen, 6.2 mm.

Color. Light grayish-brown, scutellum and median portion of pronotum darker; ventrally darker with faint yellowish-brown spots on intermediate and hind femora and abdominal segments.

Structural Characteristics. Front of head with two moderate tubercles. Pronotum nearly rectangular, lateral margins mostly straight, parallel to longitudinal axis of the body, anterior part roundly converging to the eye; lateral margin posteriorly forming almost a right angle with the posterior margin; posterior margin slightly sinuated before scutellum; posterior third of pronotum crossed by two moderate longitudinal carinations. Scutellum with moderate tumescences at lateral sides and apex, median portion depressed. Hemelytra extending beyond end of the abdomen; embolium entirely dilated. Body covered with long erect bristles which are moderately clavate. Ventral abdominal segments of the male asymmetrical; ninth segment wider than long, not as long as eighth segment. Male clasper rather large for the size of the insect, nearly straight, cylindrical,

abruptly narrowed to point at apex, twisted, aedeagal furrow obliquely crossing basal half of clasper.

Location of Type. In the British Museum at London, England.

Distributional Data. Distant described this species from a specimen from Sibsagar, Assam, India. The writer has seen a single male specimen labeled Misamari, Assam, India, June 26, 1943, D. E. Hardy, (USNM).

Comparative Notes. Shape of the pronotum, the long erect bristles and the shape of the male clasper easily separates this species from all others.

Nerthra laticollis (Guérin-Méneville)

(Pl. XII, fig. 5; Pl. XV, fig. 4)

1843. Mononyx laticollis Guérin-Méneville, Revue Zoologique Travaux Inedits, pp. 112-114.

1863. M. laticollis Guérin-Méneville; Stål, Berliner Entomologische Zeitschrift, VII, p. 406.

1899. M. laticollis Guérin-Méneville; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, pp. 407-408.

Size. Male: Length, 8.4 to 8.5 mm.; width of pronotum, 5.9 to 6.0 mm.; width of abdomen, 5.4 to 5.7 mm. Female: Length, 8.6 to 9.3 mm.; width of pronotum, 5.9 to 6.5 mm.; width of abdomen, 5.5 to 6.2 mm.

Color. Brown to blackish-brown; posterior half of each segment of the connexivum dull yellowish-brown; ventrally mostly dark brown; front femora pale yellowish-brown, femora of other legs slightly darker; posterior half of each abdominal segment near lateral margins with a dirty yellow spot.

Structural Characteristics. Five tubercles on front of head, four on frons, one on apex, the latter not visible from above, lateral tubercles of frons smaller than others. Pronotum widest at a point level with the transverse furrow, distinctly projecting beyond the base of embolium, slightly wider than abdomen; lateral margin sinuous, anterior and median portions distinctly concave, posterior portion straight or weakly concave; posterior margin of pronotum

sinuated before scutellum; posterior third of pronotum crossed by five indistinct longitudinal carinations. Scutellum elevated, a moderate oval tumescence at each side and a more obscure elongate median tumescence between them. Hemelytra extending posteriorly beyond end of abdomen nearly covering abdomen completely in the male, to a lesser extent in the female; embolium elongate, basal third narrow and distinctly concave. Bristles short, clavate, forming five groups on each hemelytron, a group on the lateral tumescences of the scutellum and one medial group near anterior margin of pronotum. Mesosternal process moderately pointed at apex, lateral margins straight. Ventral abdominal segments of the female symmetrical, more or less roundly projecting posteriorly, entirely covering anal flaps. Ventral abdominal segments of male asymmetrical, ninth segment much wider than long, slightly less in length than eighth segment, longer than seventh. Male clasper simple, slightly curved mesad, apical half distinctly narrowed, aedeagal furrow visible for short distance at apex.

Location of Type. The type of this species is apparently lost. Montandon believed two specimens in the Museum of Wien to be this species and labeled them N. laticollis (Guérin-Méneville).

Distributional Data. Guérin-Méneville in the original description gives the distribution as "New Guinea." Montandon

also examined specimens from that island. The specimens studied by the writer have all been from New Guinea and are from the following localities:

"Br. N. Guinea," no date or collector, 1 male and 1 female; Finschhafen, Apr. 21, 1944, E. S. Ross, 1 female, (CAS); Lae, N. E. New Guinea, June 1944, F. E. Skinner, 2 males and 3 females, (CAS); same place, Nov., 1944, Helfer, 1 male; Maffin Bay, "Dutch N. Guinea," Aug. 20, 1944, E. S. Ross, 1 female, (CAS); same place, June 20, 1944, E. S. Ross, 1 female, (CAS); same place, Sept. 1944, E. S. Ross, 1 female, (CAS); same place, July 1, 1944, E. S. Ross, 1 male and 1 female, (CAS); same place, Oct. 7, 1944, E. S. Ross, 1 male, (CAS); Nadyab, Markham R. val., June, 1944, K. V. Krombein, 1 male and 2 females, (USNM); "Neth. New Guinea," Dec. 10, 1944, T. Aarons, 2 females, (CAS); "New Guinea," no date or collector, 3 females.

Comparative Notes. Near N. gurneyi n. sp. from which it can be separated by the sinuous lateral margins of the pronotum and by the shape of the male clasper.

Nerthra gurneyi n. sp.

(Pl. XII, fig. 6)

Size. Male: Length, 9.3 mm.; width of pronotum, 6.3 mm.; width of abdomen, 6.15 mm. Female: Length, 9.7 mm.; width of pronotum, 7.0 mm.; width of abdomen, 6.4 mm.

Color. Light to dark brown above; ventrally entirely dark reddish-brown to blackish-brown.

Structural Characteristics. Front of head with two large median tubercles on the frons, laterad of which are a pair of indistinct tubercles, apex with a small tubercle, not visible dorsally. Pronotum widest at a level with the transverse furrow, prominently projecting beyond the base of the embolium, wider than the abdomen; lateral margin more or less rounded, anterior portion slightly concave, converging obliquely toward the eye, medial portion nearly straight, posterior portion straight or very slightly concave, converging obliquely to base of embolium; posterior margin sinuated before scutellum; posterior third of pronotum crossed by two moderate and five faint longitudinal carinations. Scutellum rather large, elevated, sides medially tumescent, a faint longitudinal tumescence medially. Hemelytra extending beyond end of abdomen in male, not quite covering anal flaps in the female; connexivum only slightly visible dorsally; embolium narrow basally, distinctly concave; hemelytra constricted at nodal suture. Groups of clavate bristles present

on pronotum, scutellum and hemelytra. Apex of mesosternal process moderately pointed, lateral margins nearly straight. Ventral abdominal segments of the female symmetrical; last abdominal segment more or less pointedly projecting posteriorly, completely covering anal flaps. Ventral abdominal segments of the male asymmetrical; ninth segment much wider than long, not quite as long as eighth segment, longer than seventh segment. Male clasper simple, curved mesad, slightly swollen before apex with short, narrow, finger-like apex.

Location of Type. Holotype male, Bougainville I., July 1 to Sept. 15, 1944, A. B. Gurney in the United States National Museum at Washington, D. C.

Distributional Data. As given for the type specimen.

Comparative Notes. This species is near N. laticollis (Guérin-Méneville) and N. mixta (Montandon). Separated from the former by the lateral margin of the pronotum, from the latter by the lesser concavity of the embolium and from both by the shape of the male clasper. The writer has examined a female specimen which he believes to be this species, but since there is not a label on the pin, it seems best not to make this specimen the allotype or even a paratype. This specimen is in the Francis Huntington Snow Entomological Museum at the University of Kansas via the Torre-Bueno Collection.

Nerthra mixta (Montandon)

(Pl. XII, fig. 13)

1899. Mononyx mixtus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 406.

1900. M. mixtus Montandon; Breddin, Senckenbergischen naturforschenden Gellschaft, Band XXV, Heft 1, p. 175.

1901. M. mixtus Montandon; Breddin, Abhandlungen der naturforschenden Gesellschaft zu Halle., XXIV, p. 24.

Size. Male: Length, 9.4 mm.; width of pronotum, 7.7 mm.; width of abdomen, 6.5 mm. Female: Length, 9.4 to 9.6 mm.; Width of pronotum, 7.7 to 7.9 mm.; width of abdomen, 6.5 mm.

Color. Uniformly dark reddish-brown except for front femora and area about bases of the other legs which are paler.

Structural Characteristics. Apex of head provided with five broad toothlike tubercles, apical tubercle ventro-caudad of the others; ocelli present. Pronotum extremely wide, much wider than abdomen; the median portion of the lateral margins more or less rounded, anterior and posterior parts of the margin distinctly converging medially; posterior margin concave before base of the scutellum, convex level with the base of the embolium. Scutellum moderately large, a tumescence on each side and at the apex. Hemelytra extending to or beyond the end of the abdomen; membrane well developed; base of embolium narrow, apical two-thirds broadly and roundly expanded. Connexivum not at all prominent,

scarcely visible in the male. Bristles dark brown, clavate, forming rows and clumps on the hemelytra, scutellum and pronotum. Ventral abdominal segments of male asymmetrical; last three segments small, distance between caudo-lateral angles of sixth segment less than half the width of the posterior margin of the fourth segment. Clasper of male constricted at the middle and then again constricted half way between the middle and the apex, simple and sickle-shaped. Ventral abdominal segments of the female nearly symmetrical, projecting posteriorly and nearly covering anal flaps, apex of posterior margin is very slightly emarginate.

Location of Type. Unknown. Montandon did not specify which of the specimens before him was the type. The type of this species is not in the British Museum with other Montandon types, at least it was not seen by Doctor H. B. Hungerford in 1928. There are two males in the Paris Museum, "Nouv. Bretagne, LIX - 1889" which were before Montandon at the time of the description. These two specimens may be considered as typical until such time as the type, if existant, is located.

Distributional Data. Montandon studied specimens from Australia, New Guinea, New Britain and Amboina. This worker has seen only three specimens, all of which are from New Guinea. They are from the following localities: Mt. Hansemann, Astrolabe B., 1901, Biro, 1 female; Lae, June, 1944, F. E. Skinner, 1 male and 1 female, (CAS).

Comparative Notes. Most closely related to Nerthra omani n. sp., but easily separated by the much wider pronotum and by the fact that the clasper is twice constricted in this species while in N. omani n. sp. this is not the case.

Nerthra omani n. sp.

(Pl. XI, fig. 5)

Size. Male: Length, 9.6 to 10.5 mm.; width of pronotum, 7.2 to 7.6 mm.; width of abdomen, 6.8 to 7.6 mm. Female: Length, 10.6 mm.; width of pronotum, 7.7 mm.; width of abdomen, 7.4 mm.

Color. Light brown to black above, the bristles a little darker; ventrally brown, reddish-brown or black except for some yellow spots on the mid and hind femora and on the pleurites about these legs.

Structural Characteristics. Apex of head with five large toothlike tubercles, apical one ventro-caudad of the others; ocelli present. Pronotum widest at transverse furrow, distinctly projecting beyond the base of the embolium, usually slightly wider than abdomen; the median portion of the lateral margins parallel or nearly so, anterior and posterior parts of the margin distinctly converging medially; posterior margin of the pronotum concave before the scutellum then extending in a more or less straight line to the lateral angle. Scutellum moderately large, a tumescence on each side and at the apex. Hemelytra extending to or beyond the end of the abdomen; membrane well developed; base of embolium narrow, apical two-thirds broadly and roundly expanded. Connexivum not at all prominent, scarcely visible in the males. Bristles dark brown, clavate, forming rows and clumps

on the hemelytra, scutellum and pronotum. Ventral abdominal segments of male asymmetrical; last three segments small, distance between caudo-lateral angles of sixth segment less than half the width of the posterior margin of the fourth segment. Clasper of male of nearly equal width for the entire length, but slightly swollen at apical third and then tapering to ovate apex which is recurved. Ventral abdominal segments of the female nearly symmetrical, projecting posteriorly and nearly covering anal flaps.

Location of Type. Holotype male, allotype female and 2 male paratypes, Guadacanal, 1944, L. J. Lipovsky, in the Francis Huntington Snow Entomological Collections at the University of Kansas. Three male paratypes, Guadacanal, June 15, 1942, Paul Oman, in the United States National Museum at Washington, D. C.

Distributional Data. Known only from Guadacanal Island in the Solomon Island.

Comparative Notes. Similar to Nerthra mixta (Montandon) but differing in that the pronotum is not nearly so wide in proportion to the width of the abdomen and in that the clasper of the male is nearly of uniform width for the entire length while in the latter species it is strongly constricted at the middle and again half way to the apex.

Northra femoralis (Montandon)

(Pl. XII, fig. 2)

1899. Mononyx femoralis Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 and 5, p. 407.

1902. M. femoralis Montandon; Horvath, Természetrajzi Füzetek, XXV, p. 612.

1925. M. femoralis Montandon; Hale, Arkiv. for Zoologi utgivet av Kongliga Svenska Vetenskapsakademien, Band 17A, No. 20, p. 16.

Size. Male: Length, 7.8 mm.; width of pronotum, 5.7 mm.; width of abdomen, 5.7 mm. Female: Length, 8.8 to 10.0 mm.; width of pronotum, 6.1 to 6.6 mm.; width of abdomen, 6.1 to 6.8 mm.

Color. Yellowish-brown to dark reddish-brown; mostly dark below, trochanters and femora of legs yellow to yellowish-brown suffused with red on the trochanters and basal halves of the femora, femora dark at apices.

Structural Characteristics. Front of head with five rather prominent tubercles, four on frons and one at the apex, the latter not visible from a dorsal view. Pronotum widest at middle, slightly projecting beyond base of embolium, about as wide as abdomen; lateral margins more or less rounded, anterior and median portions nearly straight; posterior margin broadly and weakly sinuated before scutellum; posterior third of pronotum crossed by seven indistinct longitudinal carinations. Scutellum not very elevated, a

moderate tumescence at each side, mesad of each tumescence a small oval depression. Hemelytra extending beyond end of abdomen in the male, not quite reaching end of abdomen in the female, entirely covering the abdomen laterally in the male, some of abdomen exposed laterally in the females; embolium slightly dilated laterally, lateral margin convex for entire length; hemelytra constricted at nodal suture. Groups and lines of black clavate bristles present on pronotum, scutellum and hemelytra. Mesosternal process apically blunt to moderately pointed, lateral margins nearly straight. Ventral abdominal segments of female symmetrical; last abdominal segment dilated posteriorly, nearly covering anal flaps, postero-lateral angles slightly and roundly projecting posteriorly. Ventral abdominal segments of male asymmetrical, last three small; ninth segment wider than long, slightly longer then eighth segment, about twice as long as seventh segment. Male clasper simple, curved medially, slightly rounded and swollen apically.

Location of Type. In the British Museum at London, England.

Distributional Data. Montandon's specimens were from Champion Bay, Sidney, Australia. The specimens examined by this writer are all from Western Australia. They are from the following localities:

Bridgeton, Nov. 11, Darlington, 2 females, (MCZH); Pemberton, Nov. 10, W. M. Wheeler, 1 female, (MCZH); Rottnest

Isl., Oct. 24, P. J. Darlington, 1 female, (MCZH); Wallcliffe, Margaret R., Oct., Darlington, 1 female, (MCZH); Wongong R., Perth, Jan., W. S. Brooks, 1 male, (MCZH).

Comparative Notes. Most closely related to N. gurneyi n. sp. but differing in that the clasper of the male is stouter and by the fact that the lateral margin of embolium is not concave basally and that there is a suffusion of red on the trochanters and basal halves of the femora.

It should be pointed out that in the original description Montandon states that the front of the head has only four toothlike tubercles. It is possible that he did not notice the apical tubercle which is not visible from above or that he did not consider it to be on the front of the head, or, this species may only have four tubercles on the head. Hale, 1925, also suggests that N. femoralis (Montandon) has five tubercles on the head. A comparison with type and with my drawing of the male clasper of one of the above specimens has been made by Doctor R. L. Usinger. He found them to be nearly identical; however, he indicated a slight difference in the apex of the clasper which may possibly have been due to a difference in the plane in which the clasper was studied. Unfortunately I did not have him check the tubercles of the head. If the type of N. femoralis (Montandon) does have but four toothlike tubercles on the head there is the possibility that the specimens herein

described are not this species but are N. annulipes (Horvath). It will be necessary to check also the male genitalia of the type of the latter species if such a specimen exists. Horvath's description would seem to indicate that he had only a single female specimen before him. For the present I prefer to place the specimens studied in this species. The original description of N. annulipes (Horvath) will be presented further on in this paper.

Nerthra nudata n. sp.

(Pl. XI, fig. 4)

Size. Male: Length, 9.2 to 9.6 mm.; width of pronotum, 6.0 to 6.1 mm.; width of abdomen, 6.2 to 6.5 mm.

Color. Light brown to black; bases of legs reddish, apices of femora black, rest of legs yellowish-brown; abdominal segments coppery or reddish-brown except last three segments which are brown.

Structural Characteristics. Front of head without prominent tubercles, a faint medial tubercle of frons present in one specimen. Pronotum widest at a level of the transverse furrow, barely projecting laterally beyond base of embolium, not quite as wide as abdomen; lateral margin with medial and anterior portions weakly concave; posterior margin slightly sinuated before scutellum; posterior third of pronotum crossed by three broad indistinct longitudinal carinations. Scutellum elevated, tumescences at sides and apex, weakly depressed medially. Hemelytra extending beyond end of abdomen, entirely covering abdomen; embolium elongate, lateral margin smoothly convex; hemelytra hardly constricted at nodal suture. Five patches of short clavate bristles on each hemelytron and a patch on each basal tumescence of the scutellum. Mesosternal process short, lateral margins rather broad and straight, apex very blunt, broadly flattened. Ventral abdominal segments of male asymmetrical; last three segments

small; ninth segment rather oval, longer than seventh or eighth segments, slightly wider than long. Male clasper simple, sickle-shaped; aedeagal furrow visible from a ventral view for a short distance laterally at apex, also for a short distance medially at basal fourth.

Location of Type. Holotype male and two male paratypes, Brisbane, Q., Australia, March 3, 1932, P. J. Darlington, in the Museum of Comparative Zoology at Harvard University. One male paratype, McPherson Range, Nat. Park, Q., Australia, March 16, 1932, P. J. Darlington, in the Francis Huntington Snow Entomological Museum at the University of Kansas.

Distributional Data. As given for the type series.

Comparative Notes. Easily recognized by the absence of tubercles on the front of the head and by the shape of the clasper.

Nerthra annulipes (Horvath)

1902. Mononyx annulipes Horvath, Természetrajzi Füzetek, Vol. XXV, pp. 611-612.

1902. M. annulipes Horvath; Froggatt, Agricultural Gazette of N. S. Wales, Misc. Publ. No. 538, p. 7, pl. II, fig. 25.

1943. M. annulipes Horvath; McKeown, Australian Museum Magazine, Vol. 8, No. 5, pp. 176-180.

The writer has not seen this species, or at least has not been able to recognize it.

Original description:

"Breviter ovalis, supra sordide griseus; capite antice quinque-tuberculato; pronoto longitudine sua duplo et dimidio latiore, abdomini aequilato, disco rugis longitudinalibus irregularibus praedito, marginibus lateralibus dilatatis parce subtiliterque nigro-granulatis, subrectis, parallelis, tantum apice subito introsum curvatis; scutello tuberculis tribus nigrogranulatis, duobus subbasalibus majoribus, uno anteapicali minore, instructo; hemelytris apicem abdominis subattingentibus et margines laterales abdominis pone medium anguste detectos relinquentibus, margine costali sensim arcuato, haud sinuato, corio venis elevatis nigro-granulatis instructo et praesertim prope marginem costalem parce subtiliterquenigro-granulato, membrana rudimentaria, sed distincte valvante, intus fuscolimbato; corpore subtus fusco-nigro, luteo-variegato; ventre minute granulato; tuberculo

mesosterni in processum longiusculum, antrorsum curvatum producto; pedibus luteis, maculis femorum anticorum, annulis duobus femorum posteriorum et tibiarum intermediarum, tibiis posticis (basi excepta) tarsisque fusco-nigris.

"♀Segmento ultimo ventrali apice rotundato-truncato, segmenta genitalia tegente, marginibus lateralibus subrectis. Long. 7.75, Lat. 5.25 mill.

"Clarence River.

"By the rudimentary membrane allied to M. femoralis Montd., from which it may be separated by the smaller size, the head having five tubercles in front, the mesosternal tubercle curved forwards and the dark annulated legs."

The possible relationship of this species to N. femoralis (Montandon) has been discussed in the comparative notes of that species.

Nerthra ampliata (Montandon)

(Pl. XII, fig. 8)

1899. Mononyx ampliatus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 and 5, p. 404.

1906. M. ampliatus Montandon; Distant, Fauna British India, Vol. V, p. 313.

Size. Male: Length, 9.5 to 10.4 mm.; width of pronotum, 6.9 to 7.4 mm.; width of abdomen, 6.8 to 7.3 mm. Female: Length, 9.4 to 11.1 mm.; width of pronotum, 6.5 to 7.8 mm.; width of abdomen, 6.6 to 7.8 mm.

Color. Brown above, ventrally mostly dark brown, a small yellowish-brown area near apex of hind femora.

Structural Characteristics. Front of head provided with five tubercles, four on frons and one on apex, the latter not visible from above. Pronotum widest at middle, distinctly projecting laterally beyond the base of embolium; lateral margins more or less rounded; posterior margin broadly but shallowly sinuated before scutellum; posterior third of pronotum crossed by three slight and four very faint longitudinal carinations. Scutellum elevated, tumescent at middle of lateral margins and along median line. Hemelytra extending beyond end of abdomen and laterally almost completely covering abdomen; lateral margin of embolium slightly concave at basal half, posterior part dilated; hemelytra constricted at

nodal suture. Ventral abdominal segments of male asymmetrical; ninth segment more or less oval, as long as eighth segment, longer than seventh, wider than long. Male clasper swollen at apex, indistinctly lobed laterally, concavely depressed basad of the broadest part of the dilation.

Location of Type. In the British Museum at London, England.

Distributional Data. This species is known only from New Guinea. This worker has examined specimens from the following localities:

Orazay, Dec., 1945, Helfer, 1 male; Stephansort, Astrolabe Bay, 1900, Biro, 1 female; Aligaba Crk., May 20, 1943, B. E. Rees, 1 female, (USNM); Laloki, Apr., 1909, F. Muir, 2 males and 7 females, (CAS); "N. Guinea," no date, B. P. Clark, 1 female, (USNM); "N. Guinea," no date or collector, 1 female.

Comparative Notes. This species is similar to Nerthra robusta n. sp. and Nerthra macrostyla n. sp., but differing in that it is a little smaller and in the shape of the male genitalia. The clasper of the male is much smaller than that of either of the species mentioned above. It also differs from N. robusta n. sp. in that the dilation of the apical half of the clasper is not angulate laterally but is lobed. In N. macrostyla n. sp. this portion of the clasper is also lobed, but more distinctly so, and the lobe is constricted

at the base while this is not true in the case of N. ampliata (Montandon).

Nerthra macrostyla n. sp.

(Pl. XI, fig. 8)

Size. Male: Length, 11.5 mm.; width of pronotum, 7.5 mm.; width of abdomen, 7.5 mm. Female: Length, 11.3 to 11.7 mm.; width of pronotum, 7.2 to 7.6 mm.; width of abdomen, 6.9 to 7.6 mm.

Color. Dark reddish-brown, embolium lighter with distinct, irregular black spots; mostly dark brown below, yellowish-brown area near the apex of the intermediate and hind femora and small yellowish-brown spots at the posterior lateral angles of each abdominal segment.

Structural Characteristics. Front of head provided with five rather large sharply-pointed tubercles four on frons and one at apex, the latter not visible from a dorsal view. Pronotum widest at middle, distinctly projecting laterally beyond the base of the embolium; lateral margins more or less rounded, median portion nearly straight parallel to longitudinal axis of the body, anterior and posterior portions converging obliquely to the eye and base of embolium respectively; posterior margin sinuated before scutellum; posterior third of pronotum crossed by three slight and six very indistinct longitudinal carinations. Scutellum rather large, elevated, tumescent laterally and along median line. Hemelytra extending beyond end of abdomen, completely covering abdomen laterally; embolium narrow and concave at base dilated behind concavity; hemelytra slightly constricted at

nodal suture. Groups of blackish-brown clavate bristles on the pronotum, scutellum and hemelytra. Ventral abdominal segments of male asymmetrical; ninth segment wider than long, not as long as eighth segment but longer than seventh segment. Male clasper very large, swollen apically, a large lobe on the lateral surface, concavely depressed basad of the lobe.

Location of Type. Holotype male and allotype female, Bougainville I., July 1 to Sept. 15, 1944, A. B. Gurney, and 3 female paratypes, Bougainville I., June 5, 1955, A. B. Gurney, in the United States National Museum at Washington, D. C. One female paratype, Treasury I., Solomon Is., Aug. 14, 1944, J. H. Paullus, in the Francis Huntington Snow Entomological Collection at the University of Kansas. One female paratype, Naval Air Base, Bougainville, Solomon Is., Apr. 1945, G. E. Bohart, in the Collection of the California Academy of Science, at San Francisco, California.

Distributional Data. As given for the type series. This species appears to be restricted to the Solomon Islands, however, too few specimens are known to definitely state that this species has such a limited distribution.

Comparative Notes. Very closely related to N. ampliata (Montandon) and N. robusta n. sp., but easily separated in the males by the shape of the clasper. The females are difficult to distinguish from the other species, but seem to be

more slender. As the females are so difficult to identify, one must rely upon distributional data, size, and association with the males.

Nerthra robusta n. sp.

(Pl. XI, fig. 7; Pl. XV, fig. 5)

Size. Male: Length, 11.2 to 12.5 mm.; width of pronotum, 7.6 to 8.1 mm.; width of abdomen, 7.6 to 8.0 mm. Female: Length, 11.7 to 12.5 mm.; width of pronotum, 8.3 to 8.4 mm.; width of abdomen, 7.9 to 8.2 mm.

Color. Light brown above, scutellum darker, lateral margin of the embolium with faint yellowish-brown spots; below mostly dark brown, a light spot before the apex of femur of intermediate and hind legs.

Structural Characteristics. Front of head provided with five large, rather pointed tubercles, four on frons and one at apex, the latter not visible from a dorsal view. Pronotum widest at the middle, distinctly projecting beyond base of embolium; lateral margins more or less rounded, medial portion sometimes straight, anterior and posterior portions converging obliquely to the eye and base of embolium respectively; posterior margin broadly sinuated before scutellum; posterior third of pronotum crossed by seven indistinct longitudinal carinations. Scutellum elevated, tumescent laterally and along median line. Hemelytra extending to or beyond end of abdomen, laterally in the male completely covering abdomen; embolium narrow at base, lateral margin at base distinctly concave, dilated laterally on apical half; hemelytra slightly constricted at nodal suture. Groups of

black clavate bristles on the pronotum, scutellum and hemelytra. Mesosternal process apically moderately pointed, lateral margins nearly straight, slightly rounded at apex of process. Ventral abdominal segments of male asymmetrical; ninth segment wider than long, about same length as eighth segment, longer than seventh segment. Male clasper greatly swollen apically, lateral margin of dilation forming almost a right angle at widest point.

Location of Type. Holotype male, allotype female, 3 male and 2 female paratypes, Nadzab, Markham R. val., New Guinea, June, 1944, K. V. Krombein in the United States National Museum at Washington, D. C. One male paratype, same data as above and one female paratype, same place, July, 1944, same collector, in the Francis Huntington Snow Entomological Collections at the University of Kansas.

Distributional Data. As given above for the type series.

Comparative Notes. Near Nerthra ampliata (Montandon) and Nerthra macrostyla n. sp., but differing from these in that the dilation of the apical half of the clasper of the male is distinctly angulate laterally while in the two species mentioned above the lateral margin of the dilation is more or less lobed.

Nerthra luteovaria (Distant)

(Pl. XII, fig. 4; Pl. XV, fig. 1)

1904. Mononyx luteovarius Distant, Annual Magazine of Natural History, Vol. XIV, p. 63.

1925. M. luteovarius Distant; Hale, Arkiv. for Zoologi utgivet av Kongliga Svenska Vetenskaps-Akademien, Band 17a, No. 20, p. 15.

Size. Male: Length, 7.8 mm.; width of pronotum, 5.7 mm.; width of abdomen, 5.5 mm. Female: Length, 7.8 to 8.5 mm.; width of pronotum, 6.0 to 6.4 mm.; width of abdomen, 5.8 to 6.0 mm.

Color. Uniformly bright yellowish-brown above; below mostly yellowish-brown, tarsal claws dark shiny brown, abdomen, basally and medially, brown.

Structural Characteristics. Five sharp-pointed tubercles on front of head, four on frons and one on the apex of the head, the latter not visible from above. Pronotum widest at the middle, distinctly projecting beyond base of embolium, slightly wider than abdomen; lateral margins more or less rounded, anterior portion very slightly concave; posterior margin sinuated before scutellum; posterior third of pronotum crossed by two moderate and three indistinct longitudinal carinations. Scutellum elevated, a tumescence at each side. Hemelytra extending posteriorly beyond end of abdomen, nearly entirely covering abdomen in male, connexivum more apparent in female; embolium slightly dilated, lateral

margin more or less rounded, very slightly concave at basal third. Mesosternal process with lateral margins more or less rounded, apex blunt. Ventral abdominal segments of the female symmetrical, last abdominal segment broadly expanded posteriorly, covering anal flaps. Ventral abdominal segments of the male asymmetrical, ninth segment about as long as eighth, wider than long. Male clasper short and broad, apex distinctly narrowed and bent laterally.

Location of Type. In the British Museum at London, England.

Distributional Data. The specimens examined by the writer were from Kinberley Dist., N. V., Australia, Jan., Mjoberg, 1 male and 2 females.

Comparative Notes. A small species, characterized by the shape of the mesosternal process and the clasper of the male.

Nerthra tuberculata (Montandon)

(Pl. XII, fig. 1; Pl. XV, fig. 2)

1899. Mononyx tuberculatus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 403.

Size. Male: Length, 8.5 to 8.9 mm.; width of pronotum, 6.1 to 6.4 mm.; width of abdomen, 6.0 to 6.3 mm. Female: Length, 9.2 to 9.9 mm.; width of pronotum, 6.5 to 7.0 mm.

Color. Black, covered with minute white granules which give the insect a gray appearance; front of head with white tubercles forming an inverted V; anterior edge of front trochanter and femur whitish-yellow; apex of femur, tibia and tarsus of intermediate and hind legs yellowish-brown; rest of ventral surface dark brown to black.

Structural Characteristics. Front of head with five large, sharply pointed tubercles, four on the frons and one on the apex, the latter not visible from a dorsal view. Pronotum projecting beyond base of embolium, about as wide as abdomen; lateral margin more or less rounded; transverse furrow crossed by two prominent longitudinal carinations; posterior margin deeply sinuated before scutellum. Scutellum elevated, tumescent laterally and at apex. Hemelytra extending beyond end of abdomen, overlapping in such a manner as to give the posterior end of the body a pointed effect; embolium narrow at base, quite wide at nodal suture, lateral

margin nearly straight, rounded posteriorly; hemelytra distinctly constricted at nodal suture. Abdomen almost entirely covered by the hemelytra. Body covered with dark shiny reddish-black globoid tubercles. Mesosternal process with lateral margins more or less straight, apex moderately blunt. Ventral abdominal segments of male asymmetrical; last three segments narrow; ninth about same length as eighth, longer than seventh, wider than long. Male clasper swollen ventrally near apex; in ventral view, lateral and mesal margins wedge-shaped apically.

Location of Type. In the Museum of Brussels, Brussels, Belgium.

Distributional Data. The type was from Port Denison, Australia. The writer has seen specimens from the following localities:

Southwestern Australia: Margaret R., Oct. 31, P. J. Darlington, 2 males and 2 females, (MCZH).

Western Australia: Pemberton, W. A., Nov. 10, P. J. Darlington, 1 male, (MCZH); Worgong R., Perth, W. Austr., Jan., W. S. Brooks, 1 female, (MCZH).

Comparative Notes: The white tubercles on the front of the head, shiny reddish-black globoid tubercles on the body, hemelytra pointedly projecting posteriorly and the male clasper distinguish this species from others.

Nerthra buenoi n. sp.

(Pl. III, fig. 6; Pl. X, fig. 2)

Size. Female: Length, 4.2 mm.; width of pronotum, 2.6 mm.; width of abdomen, 2.7 mm.

Color. Uniformly brown above, except the posterior half of each segment of the connexivum and the tip of the membrane of the hemelytra which are pale yellowish-brown. Light yellowish-brown ventrally with brown punctations on the abdominal segments, tarsal claw of foreleg dark brown, intermediate and hind legs with the femora ringed medially by two faint, slightly darker areas.

Structural Characteristics. Front of head with apex concavely excavated, a stout tubercle either edge of the excavation; lateral tubercles small forming into a group between the eye and the excavation of the apex. Lateral margin of the pronotum with the anterior two-thirds faintly rounded, posterior third straight, obliquely converging to base of embolium; posterior margin sinuated before scutellum. Pronotum widest at transverse furrow, not quite as wide as abdomen. Scutellum fairly large with weak tumescences on either side. Hemelytra extending beyond tip of abdomen; embolium narrow, elongate, lateral margin weakly curved. Body covered sparsely with short clavate bristles. Anterior margin of front femur forming approximately a right angle with posterior margin of femur; anterior dilation projecting

into a rather sharp point at the anterior basal angle. Abdominal segments of the female nearly symmetrical; emargination of the posterior margin of the last abdominal segment rounded; lateral areas on either side of emargination flattened, without a trace of tumescences.

Location of Type. Holotype, female, from Bnito Prov., Pernambuco, Brazil, Feb., '83, no collector, in the Francis Huntington Snow Entomological Museum at the University of Kansas.

Distributional Data. As given for the type.

Comparative Notes. This species though very closely related to N. raptoria (Fabricius) seems sufficiently different to constitute another species. It differs from the preceding species by the more pointedly projecting anterior dilation of the front femur, by the absence of tumescences on the last abdominal segment and by its smaller size.

Nerthra raptoria (Fabricius)

(Pl. III, fig. 3; Pl. VII, fig. 6;
Pl. VIII, fig. 10; Pl. X, fig. 8)

1803. Naucoris raptoria Fabricius, Systema Eleutheratorum, Vol. 3, Systema Rhyngotarum, p. 111.

1832. Mononyx raptoria (Fabricius); Laporte, Essai d'une Classification Systematique de L'order des Hémiptères, p. 16.

1835. M. raptoria (Fabricius); Brullé, Histoire Naturelle des Insectes, Band IX, p. 275.

1840. M. raptoria (Fabricius); Spinola, Essai sur les Insectes Hémiptères, Rhyngotes or Hétéroptères, p. 63.

1840. M. raptoria (Fabricius); Blanchard, Histoire Naturelle des Animaux Articules, Band 3, p. 93.

1843. M. raptorius (Fabricius); Guérin-Méneville, Revue Zoologique Travaux Inedits, p. 114.

1863. M. raptorius (Fabricius); Stål, Berliner Entomologische Zeitschrift, VII, p. 405.

1865. M. raptorius (Fabricius); Mayr, Zoologischer Theil, Band II, Abth. 1, p. 181.

1868. M. raptorius (Fabricius); Stål, Hemiptera Fabriciana, I, p. 134.

1876. M. raptorius (Fabricius); Stål, Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, p. 139.

1879. M. raptorius (Fabricius); Berg, Hemiptera Argentina, p. 186.

1886. M. raptorius (Fabricius); Uhler, Bull. Brooklyn Ent. Soc., p. 27.

1895. M. raptorius (Fabricius); Montandon, Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Universita di Torino, No. 219, Vol. X, p. 8.

1899. M. raptorius (Fabricius); Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 et 5, p. 402.

1901. M. raptorius (Fabricius); Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 352, pl. 20, figs. 27, 27a.

1906. M. raptorius (Fabricius); Distant, Fauna British India, Vol. III, p. 14.

1906. M. raptorius (Fabricius); Kirkaldy, Trans. Am. Ent. Soc., XXXII, p. 149.

1909. M. raptorius (Fabricius); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 182.

1929. M. raptorius (Fabricius); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 191-192, figs. 96-99, 105, 111.

Also referring to this species:

1858. M. fusco-conspersus Stål, Kongl. Svenska Vetenskaps-Akademiens, Handlingar, 2, p. 82.

1863. M. fusco-conspersus Stål; Stål, Berliner Entomologische Zeitschrift, VII, p. 406.

1873. M. fusco-conspersus Stål; Walker, Catalogue of Hemiptera in the British Museum, pt. VIII, p. 172.

Size. Males: Length, 5.0 to 5.5 mm.; width of pronotum, 3.1 to 3.4 mm.; width of abdomen, 3.0 to 3.35 mm. Female: Length, 5.4 to 5.5 mm.; width of pronotum, 3.55 to 3.6 mm.; width of abdomen, 3.55 to 3.6 mm.

Color. Light to dark brown above; scutellum darkest, occasionally black. Anterior dilation of front femora, intermediate and hind legs pale yellowish. Tibiae and tarsi of intermediate and hind legs with two indistinct dark rings. Venter of abdomen, brown with darker punctations. Margin of abdominal segments with the anterior half dark brown, the posterior half pale yellow.

Structural Characteristics. Apex of head concavely excavated with a stout tubercle on either side of the excavation; lateral tubercles irregular, small, grouped together to form a small raised knob between eye and apex of head; ocelli rather large. Margins of pronotum more or less rounded, occasionally with sides straighter, forming two obtuse lateral angles; slightly wider than abdomen in the males, about the same width as abdomen in the females; posterior margin with area before scutellum deeply sinuous. Scutellum with lateral tumescences prominent; a weak, median longitudinal carination present; tumescences and carina covered very sparsely with slightly clavate bristles. Hemelytra extending beyond tip of abdomen; a rather large spot which is dark and smooth at the medial angle of embolium; two groups of bristles mesad and one group of bristles caudad of this spot; bristles present along embolial suture, external edge of embolium and edge of corium; embolium narrow, elongate and slightly convex at external edge. Anterior edge of front femur greatly dilated, forming an almost right angle with the posterior edge. Abdominal segments of the male asymmetrical; ninth segment slightly longer than eighth segment, wider than long. Abdominal segments of the female nearly symmetrical; last abdominal segment deeply emarginated; anal flaps nearly as long as last segment of abdomen; a rather small tumescence on either side of emargination near the lateral margins, the one on the left side being slightly the larger. Clasper of

the male small, sickle-shaped, apex faintly hooked, aedeagal furrow visible on the distal half.

Location of Type. The type specimen, a male, is located in the Museum of Copenhagen, Copenhagen, Denmark.

Distributional Data. The literabure lists this species from Mexico through Central and South America to Argentina. This writer has examined specimens from the following localities:

Panama: Paraíso, C. Z., Jan. 16, 1911, E. A. Schwarz, 1 female, (USNM); "Pan.," no date, P. R. Uhler, 1 female, (USNM).

Brazil: Santárem, no date or collector, 1 male, compared with type by Doctor H. B. Hungerford in 1928; Rio Caiari-Uaupés, Amazonas, Sept. 1906, H. Schmidt, 1 male, (AMNH); West border of Matto Grosso, May, 1931, R. C. Shannon, 1 female, (USNM).

Comparative Notes: This species in the past was easily separated from all others by the shape of the anterior dilation of the front femur. It can be separated from N. buenoi n. sp. by its larger size, the presence of tumescences on the last abdominal segment of the female and by the rounded anterior basal angle of the anterior dilation of the front femur.

Nerthra ranina (Herrich-Schäffer)

(Pl. II, figs. 1, 2; Pl. III, figs. 2, ♂; Pl. IV, fig. 2; Pl. VII, fig. 1; Pl. X, fig. 1)

1853. Mononyx raninus Herrich-Schäffer, Die Wanzenartigen Insecten, IX, p. 28, fig. 896.

1863. M. raninus Herrich-Schäffer; Stål, Berliner Entomologische Zeitschrift, VII, p. 406.

1899. M. raninus Herrich-Schäffer; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 401.

1909. M. raninus Herrich-Schäffer; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 182.

1929. M. raninus Herrich-Schäffer; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 189-191, figs. 91-94.

Also referring to this species:

1929. Mononyx niger Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 182-184, figs. 63, 64.

Size. Male: Length, 6.2 to 7.0 mm.; width of pronotum, 4.2 to 4.9 mm.; width of abdomen, 4.0 to 4.9 mm. Female: Length, 5.8 to 8.5 mm.; width of pronotum, 3.8 to 6.0 mm.; width of abdomen, 3.8 to 6.0 mm.

Color. As with size this species is very variable in coloration. The color ranges from pale yellow or light grey to black. The writer has examined some specimens showing a combination of pale yellow with a dorsal median stripe of black.

Structural Characteristics. Apex of head concavely excavated, with a broad tubercle on either side of excavation; lateral tubercles rudimentary, generally forming an indistinct

toothlike protuberance before the lateral depression of the head, but occasionally separate and conspicuous. Pronotum with greatest width at transverse furrow, lateral margins usually rounded; posterior margin sinuated before the scutellum. Scutellum fairly large with a tumescence frequently covered with bristles, especially in small specimens from the southern part of its range. Hemelytra extending beyond end of abdomen. Bristles sparsely scattered over body, worn off in most specimens, slightly clavate in larger specimens, distinctly clavate in small specimens. Connexivum prominent, especially in the female; posterior half of each segment light, anterior half dark. Ventral abdominal segments of both male and female asymmetrical. Ninth abdominal segment of male small, approximately equal in length to eighth abdominal segment. Seventh abdominal segment at its greatest length as long as eighth abdominal segment or occasionally longer. Ventral abdominal segments of female very characteristic. Notch of posterior margin of last abdominal segment continued as a long, narrow curved groove to the right, forming a lobe on that side; an elongate depression continuing from the groove posteriorly and a circular depression at the median part of the anterior margin. A large tumescence on the left side extending along the margin of the last two abdominal segments, occasionally a very small tumescence on the right side of the last abdominal

segment near the lateral margin. The clasper of the male small and sickle-shaped, twisted, aedeagal furrow visible on apical half viewing the specimen ventrally.

Location of Type. Unknown. Other Hemipterous insects of the collection of Herrich-Schäffer are located in the Museum of München, München, Germany.

Distributional Data. The literature lists this species from Argentina, Brazil and Paraguay. The writer has studied specimens from the following localities:

Peru: Callango, no date, G. W. Kirkaldy, 5 males and 1 female; same place, no date, Haglund, 1 female, (Mus. Stockholm), type of Mononyx niger Melin; Guayabamba, Andes, Dept. Amazonas, Aug. 14-19, 1936, F. Woytkowski, 1 male; Huánuco, Andes, Dept. Huánuco, Sept. 6, 1937, F. Woytkowski, 18 males and 16 females; Marcapata, no date or collector, 1 male and 9 females; Pacasmayo, May 19-20, 1936, F. Woytkowski, 1 male; Puerto Bermúdez, Río Pichis, July 13-19, 1920, no collector, 1 male; Recardo Palma, 44 kil. E. Lima, Nov. 27-29, 1934, F. Woytkowski, 1 female; Río Perené and Chanchamayo, Dept. Junín, May, 1934, F. Woytkowski, 2 males and 4 females; San Beni, Dept. Junín, Sept. 5, 1935, F. Woytkowski, 2 males and 2 females; San Ildefonso, Río Utcubamba, Dept. Amazonas, July 29, 1936, F. Woytkowski, 1 male and 1 female; San Miguel, Prov. La. Mar., Dept. Ayacucho, July 9-12, 1941, F. Woytkowski, 12 males and 8 females; San Pedro, May 15-29, 1935, F. Woytkowski, 1 male; Santa Clara, River Rímac, Sept. 22-25, 1934, F. Woytkowski, 7 males and 4 females; Tincochaca,

Aug., 1911, no collector, 1 female; Yanamonte, Prov. La. Mar., Dept. Ayacucho, Sept. 28-30, 1941, F. Woytkowski, 2 males and 1 female.

Chile: Santiago,* Aug. 26, 1949, L. E. Peña, 1 female.

Bolivia: Corocoro, no date, purchased from Dr. O. Staudinger, 1 female; Espia, 1921-22, W. M. Mann, 1 male and 1 female, (USNM); Mojos, no date, N. Holingren, 2 males, (Mus. Stockholm); San Fernando Rapids, 1921-22, W. M. Mann, 1 female, (USNM); Sta. Helene, 1921, W. M. Mann, 1 female, (USNM).

Paraguay: "Albovena Srojo guasi", Nov. 16, 1926, F. Schade, 3 females; Alboveno, May 1, 1925, F. Schade, 1 female; Asunción, July, no collector, 3 females, (Car. Mus.); same place, Nov., no collector, 1 female, (Car. Mus.); Horgueta, Aug. 11, 1933, A. Schultze, 1 male and 1 female, (Usinger Coll.); same place, 45 mi. E., July 6, 1933, A. Schulze, 1 female, (Phila. A. S.); same place, Aug. 7, 1933, A. Schulze, 1 male and 1 female, (Phila. A. S.); same place, Aug. 10, 1933, A. Schulze, 3 females, (Phila. A. S.); "Villarrica", Jan. 6, 1923, F. Schade, 1 female; same place, May 9, 1923, F. Schade, 1 female, "Villarica Cerro pelado", Nov. 28, 1929, F. Schade, 1 female.

---

*This locality may be incorrect, however, the specimen is from Chile and extends the range of this species to that country.

Argentina: Catamarca, Jan. 24, 1924, Weiser, 1 female; same place, Corral Quemado, Mar., 1924, Weiser, 1 male and 1 female; same place, Apr. 1924, Walters, 1 female; same place, Fuerte Quemado, Feb. 1924, F. Walters, 1 male and 1 female; same place, Valle de Santa Maria, no date, F. Walters, 1 male; Chafiñán, Valde 9, Jan., 1922, Weiser, 1 male; Potrerillos, Mar. 16-19, 1920, no collector, 1 female; "Argentina," no date, Jensen-Häarup, 1 female; "Argentina," no date, Weiser, 1 male, (Mus. Prague).

Brazil: Nova Teutonia, Jan. 8, 1949, F. Plaumann, 4 males and 16 females; same place, Jan., 1948, F. Plaumann, 5 males and 4 females; same place, Apr. 1948, F. Plaumann, 4 males and 7 females; Nova Teutonia, Santa Catarina, Apr. 27, 1948, F. Plaumann, 5 males and 3 females; same place, Mar. 5, 1948, F. Plaumann, 1 female; Nova Teutonia, "Tupan L. 2", May, 1947, F. Plaumann, 12 males and 5 females; Pará, July, no collector, 1 female, (Car. Mus.); São Paulo, no date, Mraz., 1 male, (Mus. Prague).

Comparative Notes. This species can be easily separated from the other species of the genus by the shape of the male clasper and by the characteristics of the ventral abdominal segments of the female. The writer, after examining the type of Mononyx niger Melin, is of the opinion that the latter species is a synonym of Nerthra ranina (Herrich-Schäffer). There is considerable variation within this species as to

color and size. The specimens from Perú and Bolivia are on the whole darker and somewhat larger than those from Brazil, Paraguay and Argentina. The ventral abdominal segments of the female and the male clasper as well as the other structures of the body are identical.

Nerthra nepaeformis (Fabricius)

(Pl. VII, fig. 9; Pl. IX, figs. 4, 6; Pl. X, fig. 13)

1775. Naucoris nepaeformis Fabricius, Systema Entomologiae, 2, p. 693.

1803. N. nepaeformis Fabricius; Fabricius, Systema Eleutheratorum, Vol. 3, Systema Rhyngotarum, p. 111.

1868. Mononyx nepaeformis (Fabricius); Stål, Hemiptera Fabriciana, I, p. 134.

1873. M. nepaeformis (Fabricius); Walker, Catalogue of Hemiptera in the British Museum, pt. VIII, p. 171.

1876. M. nepaeformis (Fabricius); Stål, Kongl. Svenska Vetenskaps-Akademiens. Handlingar, Vol. V, p. 138.

1879. M. nepaeformis (Fabricius); Berg, Hemiptera Argentina, pp. 185-186.

1895. M. nepaeformis (Fabricius); Pittier and Biolley, Instituto Fisico Geografico Nacional (Costa Rica), p. 23.

1895. M. nepaeformis (Fabricius); Montandon, Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Universita di Torino, No. 219, Vol. X, p. 8.

1899. M. nepaeformis (Fabricius); Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 et 5, p. 401.

1901. M. nepaeformis (Fabricius); Van Duzee, Trans. Am. Ent. Soc., Vol. XXXVII, p. 352.

1901. M. nepaeformis (Fabricius); Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 351.

1906. M. nepaeformis (Fabricius); Torre-Bueno, Ent. News, Vol. 17, p. 54.

1909. M. nepaeformis (Fabricius); Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. 10, p. 182.

1925. M. nepaeformis (Fabricius); Blatchley, Ent. News, Vol. 36, p. 52.

1929. M. nepaeformis (Fabricius); Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 174-177, figs. 36-38, 103, 107.

1935. M. nepaeformis (Fabricius); Carlo, Revista Chilena de Historia Natural, Año XXXIX, pp. 106-107.

1942. M. nepaeformis (Fabricius); Kevan, Proc. Royal Ent. Soc. London, (a) 17, pts. 10-12, p. 110.

Also referring to this species:

1835. Mononyx raptorius, Burmeister, Handbuch der Entomologie, Bd. 2, Abteil, 1, p. 201. (nec. Fabricius)

1853. M. raptorius, Burmeister; Herrich-Schäffer, Die Wanzenartigen Insecten, IX, p. 27, t. 291, fig. 895.

1843. Mononyx raptorius, Amyot et Serville, Histoire Naturelle des Insectes, Hémiptères, p. 425. (nec. Fabricius)

1854. Mononyx bipunctatus Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Fordhandlingar, No. 3, XI, p. 239.

1858. M. bipunctatus Stål; Stål, Kongl. Svenska Vetenskaps-Akademiens. Handlingar, 2, p. 82.

1863. M. bipunctatus Stål; Stål, Berliner Entomologische Zeitschrift, VII, p. 405.

Size. Male: Length, 7.6 to 7.9 mm.; width of pronotum, 5.0 to 5.3 mm.; width of abdomen, 5.3 to 5.4 mm. Female: Length, 7.9 to 9.1 mm.; width of pronotum, 5.5 to 6.1 mm.; width of abdomen, 5.5 to 6.2 mm.

Color. Yellowish-brown to reddish-brown, usually the former; a dark brown spot at distal end of embolial suture, a black spot medially at posterior margin of head; segments of connexivum with a thin dark area at the anterior margin; front femora yellowish-brown, darker on the posterior third;

intermediate and hind legs yellowish ringed with brown; abdominal segments brown with spots of yellow, especially along the lateral margins.

Structural Characteristics. Apex of head more or less pointedly projecting, terminating in a pair of apical tubercles; lateral tubercles of the head smaller, separate and four or five in number on each side of the head. Pronotum widest at a level of the transverse furrow, about as wide as abdomen, projecting beyond base of embolium; lateral margins of the pronotum irregular in shape, usually with the median part straight or faintly rounded, the anterior and posterior parts straight or slightly sinuous and converging sharply toward the eye and base of embolium respectively; posterior margin nearly straight, weakly sinuated before scutellum. Scutellum without noticeable tumescences and a slight depression on either side of the median line of the body. Hemelytra extending to the end of the abdomen; embolium rather dilated, lateral margin more or less rounded. Connexivum prominent in both sexes, but especially so in the female. Ninth ventral abdominal segment of the male small, oval, two-thirds as long as wide, longer than eighth abdominal segment; ventral abdominal segments asymmetrical. Ventral abdominal segments of the female almost symmetrical; last abdominal segment medially roundly emarginated, a shallow depression on either side of emargination laterad of which

is a small tumescence. Anal flaps large, elongate. Clasper of the male sickle-shaped, simple, a slight constriction present just before apex making the apex bluntly spatulate; aedeagal furrow visible on the ventral for only a short distance at the apex.

Location of Type. Unknown. Doctor H. B. Hungerford examined a specimen of this species in the Kiel Museum, Kiel, Germany in 1928. He states in his notes that the specimen is a female "with Fabr. label."

Distributional Data. The literature gives this species a rather extensive range. Specimens from Mexico to Chile have been identified as this species. All the specimens examined by Melin, with the exception of one nymph which was questionably identified as belonging to this species, were from Brazil. This worker has examined specimens from the following localities:

Brazil: Bahia, no date, Rolle, 1 female, (CAS); Vic. João Pessoa (São Phelipe), River Juruá, July 10 to Sept. 20, 1936, A. M. Olalla, 1 female; Jurujuba, Rio de Janeiro, Jan. 6, 1920, E. G. Holt, 1 female; Nova Friburgo, May, 1935, D. M. Cochran, 1 female, (USNM); Nova Teutonia, May 15, 1935, F. Plaumann, 1 male and 1 female, (Usinger Coll.); Rio de Janeiro, Mar. 4, 1935, P. Sandig, 1 female, (USNM); Rio, no date, P. R. Uhler, 1 female, (USNM); São Paulo, no date, Marz., 7 males and 12 females, (Mus. Prague); "Braz.," no date, P. R. Uhler, 1 male, (USNM).

Paraguay: Horquaeta, 45 mi. E., Aug. 7, 1933, A. Schulze, 1 female, (PAS); same place, July 10, 1934, A. Schulze, 1 female, (PAS); Santa Barbara, Dec. 8, 1924, F. Schade, 1 female; Villarrica, Aug. 30, 1923, F. Schade, 1 male.

Argentina: "Argentina," no date, Weiser, 1 male, (Mus. Prague).

Comparative Notes. This species resembles N. patula n. n. and N. tenebrosa n. n. It can be separated from the former by the small size of the ninth ventral abdominal segment of the male and by the rounded emargination of the posterior margin of the last ventral abdominal segment of the female. It can be separated from the latter species by the dilation of the embolium and by the more symmetrical ventral abdominal segments of the female.

Nerthra patula n. n.

(Pl. VII, fig. 8; Pl. VIII, fig. 8;
Pl. X, fig. 7)

Referring to this species:

1929. Mononyx bipunctatus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 177, figs. 39-42, 108.

1942. M. bipunctatus Melin; Kevan, Proc. Royal Ent. Soc. London (a) 17, pts. 10-12, pp. 109-110.

Size. Male: Length, 8.0 to 10.8 mm.; width of pronotum 5.2 to 6.7 mm.; width of abdomen, 5.1 to 6.9 mm. Female: Length, 8.5 to 11.1 mm.; width of pronotum, 5.4 to 7.0 mm.; width of abdomen, 5.8 to 7.5 mm.

Color. A yellowish-brown to reddish-brown, median portion of pronotum and scutellum darkest; a blackish spot at the medial end of nodal furrow of the hemelytra; segments of the connexivum dark brown at the anterior half, yellow or yellowish-brown at the posterior half; base of femur and trochanter of fore leg light; femora of intermediate and hind legs light with darker rings, the basal ring of the femur of the hind leg often very faint; tibiae and tarsi of intermediate and hind legs dark brown; abdominal segments dark brown mottled with yellowish-brown; anal flaps of female yellowish-brown.

Structural Characteristics. Apex of the head more or less pointedly projecting, terminating in a pair of sharp

tubercles which are sometimes blunt or even rudimentary; lateral tubercles small, separate and four or five in number. Pronotum laterally projecting at a level with the transverse furrow; lateral margin often strongly crenulated, anterior part usually not sinuated but rounded, posterior part often sinuated, usually forming an obtuse angle with base of embolium; posterior margin before scutellum slightly sinuated. Scutellum large, sides sinuated at the base and near the apex; without noticeable tumescences, but a weak depression on either side of median line. Hemelytra extending beyond tip of abdomen in the male, about the same length as the abdomen in the female; embolium with lateral margin sometimes sinuated at the base, usually straight to slightly rounded; nodal suture longer in proportion to the length of the embolium in the female than in the male; connexivum barely visible in the male, prominent in the female. Ninth ventral abdominal segment of the male very large and broad, nearly twice as long as the eighth abdominal segment, about two-fifths as wide as fifth abdominal segment. Last ventral abdominal segment of the female with posterior margin, medially, pointedly notched, nearly symmetrical. Clasper of male sickle-shaped, simple, tapering to a rather blunt point; aedeagal furrow wide, visible on the apical half of the ventral surface.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Melin examined specimens from Perú, Bolivia, Brazil, French Guiana, Trinidad, and Mt. Roraima, (Venezuela ?). The writer has seen specimens from the following localities:

Peru: Roque near Moyobamba, Aug. 31, 1923-1925, D. Melin, 1 male and 1 female (types) (Mus. Stockholm).

Bolivia: "Bolivien," no date or collector, 1 male.

Colombia: "Metá Villa-vicencio", May 11, 1946, E. A. Chapin, 1 male, (USNM).

Brazil: Corumbá, April, no collector, 2 females, (Car. Mus.); Manáos, Aug. 1924, Begnaert, 1 female; São Paulo, no date, A. A. Barbiellini, 1 female, (USNM); "Paramaribo", Oct. 6, 1938, D. G. Geiskes, 1 male; "Brazil," no date or collector, 1 female.

British Guiana: Near New Amsterdam, July 30, 1923, F. X. Williams, 1 male; Demerara, June 25, 1901, R. J. Crew, 1 male, (CAS).

French Guiana: St. Jean, no date, W. Schaus, 1 male, (USNM).

Trinidad: St. Augustine, Sept. 20, 1942, D. K. McE. Kevan, 2 males and 2 females.

Comparative Notes. This species is very similar to the following species, N. borealis (Melin), from which it may be separated by the more laterally projecting pronotum. The writer has examined the types of both species and it is his

opinion that the latter species will probably fall as a synonym when more material is available for study. The claspers of the males are almost identical.

When Melin described this species he used the name Mononyx bipunctatus. This name had been used previously by Stål and subsequently placed in the synonomy of Mononyx nepaeformis (Fabricius) by later workers and by Melin. The name thus becomes a homonym and the species must be renamed. I propose the name Nerthra patula for this species.

Nerthra borealis (Melin)

(Pl. VIII, fig. 5)

1929. Mononyx borealis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 179, figs. 47-49.

Size. Male: Length, 7.2 mm.; width of pronotum, 4.4 mm.; width of abdomen, 4.7 mm. These are the measurements of the type, they vary slightly from the measurements given for the type by Melin.

Color: Dark yellowish-brown, pronotum and scutellum darker than hemelytra; a dark brown spot on the embolial suture at the junction with the nodal suture; posterior margin of the pronotum with thin, longitudinal, black marks; posterior margin of front femur dark brown, the rest yellowish-brown; intermediate and hind legs yellowish with darker rings on the femora, two rings on the femur of the intermediate leg, one on the femur of the hind leg; last three abdominal segments yellowish-brown, the rest of abdomen dark brown; segments of the connexivum mostly dark brown with indistinct light spots near the posterior margins of the segments.

Structural Characteristics. Apex of the head more or less pointedly projecting, terminating in two small apical tubercles; lateral tubercles of the head irregularly spaced between apical tubercles and eyes. Pronotum not very dilated laterally, less than the abdomen in width; lateral margin nearly straight, slightly sinuated at the middle; posterior

margin before scutellum moderately sinuated. Scutellum large, without tumescences and a very faint depression on either side of the median line. Hemelytra extending to end of abdomen; embolium slightly dilated, lateral margin weakly rounded. Ventral abdominal segments of male like those of N. patula n. n.; last abdominal segment large, longer than eighth abdominal segment and about two-fifths as wide as the fifth abdominal segment.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. This unique specimen is from Brazil, no date, Boucord (Mus. Stockholm).

Comparative Notes. Very near N. patula n. n., but differing by having the lateral dilation of the pronotum weak, the lateral margin of the pronotum nearly straight.

Nerthra tenebrosa n. n.

(Pl. VII, fig. 10; Pl. VIII, fig. 7;
Pl. X, fig. 12)

1929. Mononyx obscurus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 178, figs. 43-46.

Size. Male: Length, 8.3 to 8.5 mm.; width of pronotum, 5.5 to 5.6 mm.; width of abdomen, 5.3 to 5.8 mm. Female: Length, 8.7 to 9.7 mm.; width of pronotum, 5.8 to 6.2 mm.; width of abdomen, 5.9 to 6.5 mm.

Color. Variable as in the other species from a yellowish-brown to reddish-brown; a dark brown spot at the distal end of the embolial suture; a small, medial, black spot on the posterior margin of the head; posterior margin of the pronotum with small irregular spots of brown; segments of the connexivum dark brown or with the posterior third yellowish; trochanter and base of femur of fore leg, femora of intermediate and hind legs yellowish; femora of intermediate and hind legs ringed with brown; abdominal segments either entirely dark brown or spotted with yellowish-brown.

Structural Characteristics. Apex of head more or less pointedly projecting, terminating in a pair of apical tubercles; lateral tubercles of the head small, spearate, four or five in number. Pronotum widest at a level with the transverse furrow; lateral margin projecting beyond base of embolium; anterior three-fourths of lateral margin nearly straight, usually slightly convex; posterior fourth straight, extending obliquely to base of embolium; posterior margin sinuated

before scutellum. Scutellum large, without lateral tumescences; a faint depression on either side of median line of the body. Hemelytra extending to or beyond the end of the abdomen in the males and some females, but shorter than abdomen in some female specimens; embolium sinuated at basal third. Ventral abdominal segments of male asymmetrical; ninth segment small, slightly wider than long, longer than eighth segment. Ventral abdominal segments of female asymmetrical; posterior margin of last abdominal segment deeply and roundly notched medially; last abdominal segment very long, nearly as long as wide; area about notch pinched up as a result of the narrowing; a prominent depression on either side of the notch, laterad of which is a moderate tumescence, the one on the left slightly the larger. Clasper of the male sickle-shaped, simple, rather abruptly curved and pointed at the apex; aedeagal furrow visible on the apical half of the ventral surface.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Melin examined specimens from Mexico, Colombia and Bolivia. The writer has seen specimens from the following localities:

Colombia: Bogotá, no date, Lindig., typus male and allotypus female, (Mus. Stockholm); Cali, no date, W. F. H. Rosenberg, 2 females, (USNM); Gallegos, 1937, no collector, 1 female, (USNM); Medellín, 1938, no collector, 1 female,

(USNM); Minca, May, 1919, no collector, 1 female, (Car. Mus.); Muzo, no date, H. Apolimar-Maria, 1 male, (CAS); Río Dagua, no date, W. F. H. Rosenberg, 1 male, (USNM); Río Frío, Feb., 1924, W. M. Mann, 1 male and 4 females, (USNM).

Ecuador: Santa Inéz, no date, R. Haënsch, 1 male, (CAS); Tena, Feb. 23, 1923, F. X. Williams, 1 male and 2 females.

Panama: Colon, no date, P. R. Uhler, 1 male, (USNM); same place, no date, C. F. Baker, 1 male, (USNM).

British Honduras: Punta Gorda, Feb., 1931, J. J. White, 1 male, (PAS).

Comparative Notes. This species may be separated from N. nepaeformis (Fabricius) by the embolium being sinuous at the basal third, by the clasper of the male, and by the asymmetry of the last abdominal segment of the female.

The name Mononyx obscurus Melin is a homonym of Mononyx obscurus Stål and must be renamed. I propose the new name Nerthra tenebrosa for this species.

Nerthra parvula (Signoret)

(Pl. VII, fig. 4; Pl. VIII, fig. 13)

1864. Mononyx parvulus Signoret, Annales de la Société des Entomologique de France, XXXIII, p. 588.

1873. M. parvulus Signoret; Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 172.

1899. M. parvulus Signoret; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 402.

1909. M. parvulus Signoret; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 182.

1929. M. parvulus Signoret; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 188-189, figs. 88-90, 110.

1935. M. parvulus Signoret; De Carlo, Revista Chilena de Historia Natural, Año XXXIX, pp. 106-107.

Size. Male: Length, 5.8 to 6.1 mm.; width of pronotum, 3.7 to 3.8 mm.; width of abdomen, 3.6 to 3.9 mm.

Color. Yellowish-brown, scutellum darker; a dark brown spot at distal end of embolial suture; a small, median, blackish spot on the posterior margin of the head; segments of the connexivum entirely dark or darker on the anterior margins; front legs brown; intermediate legs, hind legs and abdomen pale yellowish-brown, ringed and spotted with brown respectively.

Structural Characteristics. Apex of the head weakly pointedly projecting, terminating in a small blunt knob; small indistinct superapical tubercles present; lateral tubercles small, indistinct. Pronotum widest at a level

with the transverse furrow, barely projecting beyond base of embolium, equal to or less than abdomen in width; lateral margins nearly straight for anterior three-fourths, slightly sinuated at the middle; posterior margin sinuated before scutellum. Scutellum rather large, with a moderate tumescence on either side and a weak median longitudinal carination. Hemelytra extending to or beyond the end of the abdomen; embolium elongate, lateral margin straight or weakly convex. Connexivum nearly covered by the hemelytra. Ventral abdominal segments of the male asymmetrical; ninth abdominal segment oval, wider than long, about equal in length to eighth abdominal segment. Clasper of the male simple, sickle-shaped, rather slender, aedeagal furrow visible on the apical half of the ventral surface.

Location of Type. In the British Museum at London, England.

Distributional Data. This species is known only from Chile. The writer has examined only two specimens of this species, they are from the following localities: "Sonora," no date, P. R. Uhler, 1 male, (USNM); "Chile," no date, Porter, 1 male, (USNM).

Comparative Notes. Near N. ranina (Herrich-Schäffer), but differing in the shape of the apex of the head, the pronotum not as projecting laterad, and in the shape of the clasper of the male.

Nerthra unicornis (Melin)

(Pl. VIII, figs. 3, 3a; Pl. IX, fig. 9)

1929. Mononyx unicornis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 179-180, figs. 50-53.

Size. Male: Length, 7.1 to 7.2 mm.; width of pronotum, 4.5 to 4.6 mm.; width of abdomen, 4.5 to 4.6 mm.

Color. Brown to reddish-brown; a dark brown spot at the distal end of the embolial suture; posterior margins of the connexivum, intermediate legs, hind legs and abdominal segments with yellowish-brown areas.

Structural Characteristics. Apex of head pointedly projecting, terminating in a pair of sharp apical tubercles, fused medially, the degree of fusion variable in the different specimens; lateral tubercles small, irregular, forming an indistinct tooth-like protuberance before the eye. Pronotum very slightly projecting laterally beyond the base of embolium, widest at a level with the transverse furrow; lateral margins nearly straight for the anterior three-fourths, slightly sinuated before scutellum. Scutellum moderately large, a weak tumescence on either side and a slight median longitudinal carination present. Hemelytra extending to or beyond end of abdomen; embolium elongate, lateral margins nearly straight or slightly convex. Connexivum almost covered by the hemelytra. Body covered with slightly clavate bristles, a group of black bristles on the tumescences of the scutellum either in oval patches or short irregular

longitudinal bands. Ventral abdominal segments of male asymmetrical; ninth segment small, almost identical with the abdominal segments of N. nepaeformis (Fabricius). Clasper of male also resembling that of N. nepaeformis (Fabricius).

Distributional Data. Melin studied specimens from French Guiana and Brazil. The writer has examined the type, a male from São Leopoldo, Brazil, no date or collector, (Mus. Stockholm) and another male from Pará, Brazil, no date or collector, (Car. Mus.).

Comparative Notes. N. unicornis Melin seems to the writer to be very near N. nepaeformis (Fabricius). It differs from the latter species by the fusion of the apical tubercles, by the less dilated pronotum and by a slight difference in the shape of the male clasper. The writer unfortunately has not been able to examine a female of this species.

Nerthra peruviana (Montandon)

(Pl. VII, fig. 7; Pl. VIII, fig. 11; Pl. X, fig. 3)

1905. Mononyx peruvianus Montandon, Annales Musei Nationalis Hungarici, Vol. III, p. 403.

1909. M. peruvianus Montandon; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 182.

1929. M. peruvianus Montandon; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 180, figs. 54-57.

1931. M. peruvianus Montandon; De Carlo, Revista de la Sociedad Entomologica Argentina, III, No. 17, p. 329.

Size. Male: Length, 6.9 to 7.3 mm.; width of pronotum, 5.0 to 5.3 mm.; width of abdomen, 5.0 to 5.3 mm. Female: Length, 7.4 to 8.3 mm.; width of pronotum, 5.4 to 6.0 mm.; width of abdomen, 5.6 to 6.8 mm.

Color. Uniformly yellowish-brown to reddish-brown above with a dark spot at junction of embolial and nodal sutures. Ventrally slightly darker. Front femur pale yellow to light brown, lighter than the trochanter. Intermediate and hind legs mostly dark brown, with a lighter area at the base of the femora, occasionally the legs are light with dark rings.

Structural Characteristics. Apex of the head more or less projecting with a fairly large pair of sharp-pointed tubercles at apex; lateral tubercles smaller, separate, four or five in number. Pronotum with lateral margins rounded, occasionally with anterior third and posterior fourth

straight to slightly concave. Pronotum of male as wide as abdomen, not as wide as abdomen in females. Scutellum with two longitudinal bands of long narrow black bristles. Bristles of the body numerous, small, light brown, not swollen apically. Hemelytra well developed, extending to or beyond end of abdomen. Abdomen of female prominently expanded laterally. Ventral abdominal segments of male asymmetrical; ninth segment rounded in shape, longer than seventh or eighth segments. Ventral abdominal segments of female nearly symmetrical. Posterior margin of last abdominal segment medially emarginated with a slightly lateral depression on either side, laterad of which is a moderate tumescence, the one on the left slightly larger than the one on the right.

Location of Type. In the Budapest Museum, Budapest, Hungary.

Distributional Data. This species has been reported from Perú and Argentina. Specimens from the following localities have been examined by this worker:

Peru: Callango, no date or collector, 9 males and 11 females, one compared with the type by Doctor H. B. Hungerford, in 1928; Chanchamayo, no date, W. F. H. Rosenberg, 1 female, (USNM); Rioja, Dept. San Martín, Sept. 9 to Oct. 3, 1936, F. Woytkowski, 1 male and 1 female; Río Perené and Chanchamayo, Dept. Junín, May, 1934, F. Woytkowski, 1 male and 1 female; "Sani Beni", Dept. Junín, Nov. 9, 1935, F.

Woytkowski, 1 female; San Pedro, May 29, 1935, F. Woytkowski, 4 males and 1 female; "Perú," no date or collector, 1 female, (Mus. Prague).

Ecuador: Tena, Apr. 13, 1923, F. X. Williams, 1 male and 1 female.

Bolivia: Huachi, Río Beni, Sept. 1921, W. M. Mann, 1 male, (USNM).

Comparative Notes. This species is easily recognized by the longitudinal bands of long, narrow black bristles on the scutellum, the ventral abdominal segments of the female and the clasper of the male. Of the specimens examined only one specimen lacked the bristles on the scutellum, apparently having been rubbed off in pinning the specimen.

Nerthra montandoni (Melin)

(Pl. VIII, figs. 1, 1a; Pl. X, fig. 5)

1929. Mononyx montandoni Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 195, fig. 95.

1942. M. montandoni Melin; Kevan, Proc. Royal Ent. Soc. London (a), 17, pts. 10-12, p. 110.

Size. Male: Length, 5.5 to 5.8 mm.; width of pronotum, 3.7 to 4.1 mm.; width of abdomen, 3.7 to 4.1 mm. Female: Length, 5.5 to 6.1 mm.; width of pronotum, 3.8 to 4.1 mm.; width of abdomen, 3.9 to 4.3 mm.

Color. Yellowish-brown, spotted with small brown markings; a dark brown spot at the distal end of the embolial suture; a blackish spot at median part of posterior margin of head; segments of connexivum dark brown anteriorly, pale yellowish posteriorly; ventral surface more or less light yellow; front femora, rings on intermediate and hind femora and spots on the abdomen brown.

Structural Characteristics. Apex of the head concavely excavated with a blunt tubercle on either side of the excavation; lateral tubercles of the head small, blunt and irregularly spaced. Pronotum about as wide as abdomen, less than width of abdomen in some specimens; lateral margins more or less rounded very slightly projecting beyond the base of the embolium; posterior margin prominently sinuated before scutellum. Scutellum fairly large, somewhat elevated; a moderate tumescence on either side and a weak median longitudinal carination present. Hemelytra extending to or

beyond end of abdomen; embolium elongate, narrow with lateral margin slightly rounded. Rather large, clavate bristles scattered over body, more or less clumped; a narrow longitudinal band of black clavate bristles on tumescences of the scutellum. Abdomen posteriorly broadly dilated laterally, rather truncate. Ventral abdominal segments of male asymmetrical; ninth segment oval, slightly wider than long, about the same length as eighth segment or slightly longer. Ventral abdominal segments of female slightly asymmetrical; posterior margin of last abdominal segment emarginated medially, notch more or less triangular in shape; a slight depression on either side of notch laterad of which is a moderate tumescence, the one on the left the larger. Clasper of male simple, apical part more or less wedge-shaped, directed mesad.

Location of Type. Holotype, female, in the Museum of Stockholm, Stockholm, Sweden. Allotype, male, Icta, Trinidad, XI- 19- 1941, N. Hynes, in the Francis Huntington Snow Entomological Museum at the University of Kansas.

Distributional Data. Melin examined two females of this species from Venezuela. The writer has before him three specimens from Trinidad. One male and one female from Icta, Nov. 19, 1941, N. Hynes; the other a male, merely labeled "Trinidad, W. I.," Dec. 14, 1902, Chipman, (CAS).

Comparative Notes. Melin said this species was near N. ranina (Herrich-Schäffer), but the abdominal segments of

the female are entirely different. The species may be separated from N. peruviana (Montandon) by the concavely excavated apex of the head. The male can be separated from both species by the shape of the clasper.

Melin had only the females of this species before him when he described this species, therefore, I designate the male specimen from Icta, Trinidad, Nov. 19, 1941, N. Hynes, as the allotype of this species.

Nerthra planifrons (Melin)

1929. Mononyx planifrons Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 186, figs. 74-76.

The writer has not seen Nerthra planifrons (Melin), or at least has been unable to identify the species. The original description of the species follows.

"Front of caput fairly even, without medial ridge or knob; medial processes knoblike, well separated; some small, apical knobs appearing between them; lateral ones forming an irregular, toothlike knob before depression, which is rather slightly marked. Structure of pronotum somewhat but not strongly marked; side anteriorly, strongly projecting beyond base of hemelytrae; edge rounded and crenulated, somewhat sinuated in the middle; posterior part not bent angularly; anterior corner forming an obtuse angle; posterior margin before scutellum less sinuated than in amplicollis. Scutellum with distinct traces of protuberances. Embolium dilated. Abdomen of female dilated terminally, apically somewhat truncated; 6th segment of female jammed, at posterior margin deeply notched to an acute, somewhat rounded angle; lamellae broadly wedge-shaped. Bristles fine and fairly short.

Coloration blackish-brown; segments of connexivum posteriorly with indistinct light spots; abdomen, ventrally,

darkish-brown with posterior corner of segments light; legs dark; femora of 2nd and 3rd pair lighter with traces of dark rings.

Length 10, breadth 6 mm.

Museum of Kobenhavn: 1 female, Parzudaki, Mexico. (type)."

Nerthra amplicollis (Stål)

(Pl. VII, fig. 13; Pl. VIII, fig. 14; Pl. X, fig. 15)

1854. Mononyx amplicollis Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Fordhandlingar, Band XI, No. 3, p. 239.

1863. M. amplicollis Stål; Stål, Berliner Entomologische Zeitschrift, VII, p. 406.

1873. M. amplicollis Stål; Walker, Catalogue of Hemiptera in British Museum, part VIII, p. 172.

1876. M. amplicollis Stål; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 138.

1899. M. amplicollis Stål; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 400.

1901. M. amplicollis Stål; Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 350, Pl. XX, fig. 26.

1909. M. amplicollis Stål; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1929. M. amplicollis Stål; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 184-185, figs. 65-68, 104, 109.

Size. Male: Length, 10.8 to 12.7 mm.; width of pronotum, 6.8 to 7.7 mm.; width of abdomen, 6.7 to 7.5 mm. Female: Length, 10.5 to 14.7 mm.; width of pronotum, 6.3 to 9.3 mm.; width of abdomen, 6.7 to 9.1 mm.

Color. Brown to black, frequently reddish brown; connexivum entirely dark or with thin pale areas at the posterior margins of the segments; apex of head, front trochanter, anterior and basal part of front femur and a spot near apex of hind femur yellow or orange; posterior margin of front femur, front tibia-tarsus, intermediate and hind legs and abdomen dark brown.

Structural Characteristics. Apex of the head broadly concavely excavated; a short broad tubercle on each side of the excavation; lateral tubercles indistinct, forming a slight tooth-like protuberance. Pronotum as wide at the anterior third as at the level of the transverse furrow; projecting beyond the base of the embolium, but not as wide as the abdomen; lateral margin with the median third, straight and parallel with the longitudinal axis of the body, anterior third straight obliquely converging to the eye, posterior third straight converging obliquely to the base of the embolium; posterior margin sinuated before the scutellum. Scutellum large, elevated except at the basal angles. Hemelytra extending beyond the end of the abdomen; embolium slightly dilated; lateral margin concave at the base, slightly convex the remainder of its length. Connexivum almost completely covered by the hemelytra in the male, moderately prominent in the female. Ventral abdominal segments of male asymmetrical; ninth segment twice as wide as long, longer than eighth segment and about the same length as the seventh segment; seventh segment not visible on the lateral two-thirds of the right side. Female ventral abdominal segments nearly symmetrical; posterior margin of last abdominal segment deeply and pointedly notched. Anal flaps elongate and rather large. Clasper of the male more or less bifurcate.

Location of Type. In the Museum of Stockholm at Stockholm, Sweden.

Distributional Data. Kirkaldy and Torre-Bueno list this species from Costa Rica, Colombia, Venezuela, Ecuador and Bolivia. This worker has examined specimens from the following localities:

Costa Rica: San José, no date, M. Valerio, 1 male, (USNM).

Venezuela: Mérida, no date, W. Robinson, 5 males and 3 females, (USNM); same place, no date or collector, 1 female, (AMNH); "Venez.," no date or collector, 1 male and 7 females, (USNM).

Bolivia: "Bolivia," no date or collector, 1 male and 1 female.

Colombia: Cincinnati, Feb., 1924, W. M. Mann, 1 male, (USNM); Fusagasugá, June, 1917, Apolinar Mariá, 1 female; Villavicencio, Oct., 1916, A. Mariá, 1 male, (CAS); "Colombia," no date, F. C. Nicholas, 1 female, (AMNH); same place, no date, C. F. Baker, 4 females, (USNM); same place, no date or collector, 1 female.

Ecuador: Balzapamba, no date, R. Haensch, 1 male; Rio "Mapoto", Mar. 24, 1939, F. M. Brown, 1 female, (AMNH); Santa Inéz, no date, R. Haensch, 1 male and 1 female; same place, no date, R. Haensch, 3 males and 2 females, (CAS).

Peru: Lima, no date, Soukup, 1 male, (USNM); same place, no date or collector, 1 female; "Perú", no date, P. R. Uhler, 1 male, (USNM); "Perú," no date or collector, 1 female, (AMNH).

Comparative Notes. This is the largest American species, however, it varies considerably in size and thus size alone is not always sufficient to separate this species from the others. The deep triangular emargination and the large elongate anal flaps which do not overlap anteriorly will separate the females from all other species except N. ecuadorensis (Melin) which is smaller, which has the abdomen more broadly expanded laterally than most females of N. amplicollis (Stål) and which has the emargination of the last abdominal segment more rounded than in N. amplicollis (Stål). The males of this species have the clasper more or less bifurcate, the two parts of this bifurcation are of approximately the same size and both are sharp-pointed. In this respect it differs from N. ecuadorensis (Melin) and N. ater (Melin), both of which have the dorsal process greatly reduced and not at all sharp-pointed.

Nerthra ecuadorensis (Melin)

(Pl. VIII, fig. 4; Pl. IX, fig. 5; Pl. X, fig. 6)

1929. Mononyx amplicollis var. ecuadorensis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 185, figs. 69, 70.

Size. Male: Length, 8.1 to 10.2 mm.; width of pronotum, 5.0 to 6.2 mm.; width of abdomen, 5.2 to 6.2 mm. Female: Length, 8.8 to 10.2 mm.; width of pronotum, 5.6 to 7.0 mm.; width of abdomen, 5.9 to 6.8 mm.

Color. As in Nerthra amplicollis (Stål).

Structural Characteristics. This species is very similar to the preceding species and differs from that species only in a few respects. It is smaller than N. amplicollis (Stål); in the case of the females, the abdomen usually is broader in proportion to the length of the body than in the latter species, however, this is not always true and in the opinion of the writer, it is not a very good character; the emargination of the posterior margin of the last ventral abdominal segment of the female is more rounded than in N. amplicollis (Stål); the males are smaller than in the latter species and the clasper differs in that the dorsal process is reduced, it varies slightly in that the process may be more or less cylindrical while in other specimens it is flattened in a radial plane to the longitudinal axis of the clasper.

Location of Type. In the Museum of Helsingfors, Helsingfors (Helsinki), Finland.

Distributional Data. Melin described this species as a subspecies of N. amplicollis (Stål), from two female specimens from Ecuador. This worker has studied specimens from the following localities:

Ecuador: Macas, no date, A. Heyne, 1 male; same place, no date or collector, 2 females; "Normandia", no date or collector, 1 female.

Colombia: "Bet. Queremal and Buenaventura", Feb. 3, 1935, H. F. Schwarz, 1 male, (AMNH).

Peru: "Aquaitia", Dept. Loreto, Sept., 1946, F. Woytkowski, 1 male; Vic. Guayabamba, Andes, Dept. Amazonas, Aug. 14-19, 1936, F. Woytkowski, 1 female; Río Perené and Chanchamayo, Dept. Junín, May, 1934, F. Woytkowski, 1 male; Vic. San Pedro, May 29, 1935, F. Woytkowski, 2 females; Tarma, Dept. Junín, March 1-15, 1948, F. Woytkowski, 5 males and 2 females; Tinccochaca, Aug. 8, 1911, Yale Peruv. Exp., 1 male and 1 female, (USNM).

Panama: Boquete, Chiriquí Prov., March 6, 1923, F. M. Gaige, 1 male.

Comparative Notes. This species has been raised from subspecific rank to that of a full species on the fact that the males are consistent in the reduction of the dorsal process of the clasper and in being of a smaller size, and because at the present time there is no evidence that the two forms do not occur in the same localities. It should be pointed out, however, that there is no definite proof that

the males before this worker actually are the same species as the females. In the series of specimens a pair was taken at Tinccochaca, Perú on the same day and 5 males and 2 females were taken at Tarma, Perú in a fifteen day period. While such evidence is not positive, it is sufficient to consider the two sexes as one species, in view of their morphological similarities.

Nerthra ater (Melin)

(Pl. VIII, fig. 2, 2a)

1929. Mononyx ater Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 185-186, figs. 71-75.

Size. Male: Length, 9.1 to 9.2 mm.; width of pronotum, 5.6 to 5.8 mm.; width of abdomen, 5.7 to 5.8 mm.

Color. Black above; posterior margin of the pronotum and the vertex of the head light brown; much lighter below; legs mainly light yellowish brown; abdomen slightly paler.

Structural Characteristics. The writer has examined the type of this species and has found it to be very similar to Nerthra ecuadorensis (Melin). It differs from the latter species in color, by the more rounded anterior and posterior parts of the lateral margins of the pronotum and by the shape of the clasper of the male. The clasper of N. ater (Melin) has a thin concave plate-like process which is flattened in a tangential plane to the longitudinal axis of the clasper at the same point of origin as the dorsal part of the bifurcation of Nerthra ecuadorensis (Melin). The ventral abdominal segments are identical with the last named species.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. The type is from Bogotá, Colombia. Another specimen questionably placed in this species by Melin is from Costa Rica. This specimen is in the Museum of Paris.

Comparative Notes. It is the opinion of this writer that this may possibly be only an aberrant specimen of N. ecuadorensis (Melin). However, until the other specimen in the Museum of Paris can be studied I prefer to retain this species. There is also a possibility that this species could be the male of Nerthra rudis (Melin). If such should prove to the the case, N. ater (Melin) would fall as a synonym of the latter species.

Nerthra rudis (Melin)

(Pl. X, fig. 10)

Referring to this species:

1929. Mononyx fuscipes var. rudis Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 182, fig. 62.

Size. Female: Length, 8.9 to 10.6 mm.; width of pronotum, 5.3 to 6.4 mm.; width of abdomen, 5.4 to 6.1 mm.

Color. Yellowish-brown to black; scutellum dark brown or black; a small yellow spot at the posterior angle of each segment of the connexivum; ventral surface light brown or brown with femora of legs, median portion of abdomen and anal flaps yellow.

Structural Characteristics. Apex of the head concavely excavated; lateral tubercles forming a moderate tooth-like protuberance between the eye and apex of the head. Pronotum widest at a level with the transverse furrow, about as wide as abdomen; lateral margin with the anterior three-fourths nearly straight, slightly convex then weakly concave; posterior margin sinuated before scutellum. Scutellum slightly elevated, a depression at each basal angle. Hemelytra extending beyond tip of abdomen; lateral margin of embolium slightly convex. Connexivum moderately exposed dorsally. Ventral abdominal segment of the female nearly symmetrical; posterior margin of the last abdominal segment medially,

deeply and pointedly emarginated; a slight depression on either side of the emargination. Anal flaps large, elongate, the anterior end of the left anal flap twisted to the right and covering the anterior end of the right anal flap.

Location of Type. In the Museum of Helsingfors, Helsingfors (Helsinki), Finland.

Distributional Data. The type is from Vera Cruz, Mexico. Another specimen studied by Melin is from Guatemala. This worker has seen specimens from the following localities:

Costa Rica: "Río Virilla", Dec. 26, 1931, H. Schmidt, 4 females.

Panama: Bohio, C. Z., Feb. 7, 1911, E. A. Schwarz, 1 female, (USNM); Buenaventura, Mar. 10, 1911, A. Busck, 1 female, (USNM); XX Plantation, 6 mi. E. Portobelo, Feb. 16, 1930, T. O. Zschokke, 1 female, (CAS).

Ecuador: "Bucay", no date, Campos, 1 female.

Comparative Notes: The wirter has not seen the type of this species, but the description and the drawings of this species made by Melin could not possibly belong to N. fuscipes (Guérin-Méneville). The front of the head, the general shape and especially the shape and size of the anal flaps connect this species to the amplicollis group. I take this opportunity to remove this name as a subspecies of N. fuscipes (Guérin-Méneville) and elevate it to specific rank. Further study may prove that this is only a subspecies of N. amplicollis Stål, but the anal flaps seem to me to be sufficiently different to constitute a good species.

Nerthra lata (Montandon)

1899. Mononyx latus Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, Nos. 4 & 5, p. 399.

1909. M. latus Montandon; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 181.

1929. M. latus Montandon; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 186-187, figs. 77-79.

Size. Female: Length, 10.5 mm.; width of pronotum, 6.4 mm.; width of abdomen, 6.5 mm.

Color. Brown, except for the femora of the legs which are pale yellow.

Structural Characteristics. Apex of head slightly projecting ventrally, concavely excavated above this projecting part; apex terminating in two small tubercles which are barely visible in a dorsal view. Pronotum not as wide as abdomen; lateral margin more or less rounded, anterior part slightly concave, margin faintly crenulated; posterior margin sinuated before scutellum. Scutellum moderate, with slight lateral tumescences and a weak median longitudinal carination. Hemelytra extending beyond end of the abdomen; embolium concave and narrow at base; a constriction at the nodal suture. Connexivum slightly exposed. Ventral abdominal segments of the female nearly symmetrical, rather broad; last abdominal segment with posterior margin medially emarginated, anterior part of notch more or less rounded.

Location of Type. In the British Museum, London, England.

Distributional Data. The type is labeled "Nanegal-Equateur." Melin examined two specimens from Ambato, Ecuador, and "Antiochia", Colombia. The writer has seen only the latter specimen. It has, in addition to the locality, the label marked "Schh.", but has no date. It is located in the Museum of Stockholm.

Comparative Notes. This specimen seems to fit Montandon's description fairly well, although there are only two small apical tubercles of the head instead of three, and in that the abdomen is not so widely expanded that it can be readily separated from some of the other American species, as Montandon states. Except for the two very small apical tubercles and a slight difference in the shape of the lateral margin of the pronotum, the specimen studied by the writer looks like N. amplicollis (Stål) or more especially like N. ecuadorensis (Melin). This name must be retained until the type can be examined and compared with the other species.

Nerthra quinquedentata (Melin)

(Pl. X, fig. 4)

1929. Mononyx quinquedentatus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 188, figs. 84-87.

Size. Female: Length, 7.5 to 8.2 mm.; width of pronotum, 4.9 to 5.4 mm.; width of abdomen, 5.0 to 5.8 mm.

Color. Light yellowish brown to black, scutellum and median part of pronotum darker; a small dark brown spot at the distal end of the embolial suture; anterior part of segments of the connexivum, brown or black, posterior part pale yellow; front legs light brown, intermediate and hind legs pale yellow ringed with brown; abdominal segments dark brown with yellowish-brown punctations.

Structural Characteristics. Apex of head pointedly projecting, terminating in one apical tubercle; a pair of superapical tubercles present; one lateral tubercle present on either side of the head, as large as the superapical tubercles. Pronotum widest at a level with the transverse furrow, not as wide as the abdomen; lateral margin with the anterior three-fourths nearly straight to weakly rounded, distinctly converging anteriorly; posterior margin sinuated before scutellum. Scutellum fairly large with moderate lateral tumescences and a weak longitudinal carination; a slight depression between the lateral tumescence and carination; tumescences and carination covered rather thickly with

brown bristles which are slightly clavate. Hemelytra extending beyond the end of the abdomen. Connexivum moderately prominent. Ventral abdominal segments of the female asymmetrical; last abdominal segment with the posterior margin medially deeply emarginated, anterior end of emargination twisted slightly to the right; a tumescence near the lateral margin on each side, the one on the left side much larger than that on the right side; three depressions on the last segment, one on either side of the emargination and one medial depression, the lateral depression on the left side large and extending from a point slightly to the left of the median line along the anterior margin of the last segment to the base of the large tumescence on the left side.

Location of Type. In the Museum of Copenhagen, Copenhagen, Denmark.

Distributional Data. Melin studied two specimens from Argentina. This worker has examined specimens from the following localities:

Argentina: "Argentina," no date, Wehseregt, 1 female, (Mus. Prague); Mendoza, no date, G. S. Reed, 1 female.

Brazil: Nova Teutonia, Dec., 1946, Fritz Plaumann, 1 female.

Chile: "Chile," Dec., 1923, no collector, 4 females.

Comparative Notes. This species is easily identified by the presence of five tubercles on the front of the head and by the shape of the ventral abdominal segments of the female. It seems to be most closely related to Nerthra mexicana (Melin) and N. martini n. sp. although its range is remote from that of these two species.

The four females from Chile are not typical. The toothlike tubercles of the head are almost completely obsolete and the ventral abdominal segments vary slightly from those of the typical female in that the apex of the emargination of the last segment is not bent to the right and in that the tumescence on the left side of the last segment is a little larger. While these specimens may be a distinct subspecies or even a good species, until more specimens and especially males can be studied, it seems best to include them with this species.

Nerthra mexicana (Melin)

(Pl. VII, fig. 3; Pl. IX, figs. 1, 7; Pl. X, fig. 14)

1929. Mononyx mexicanus Melin, Zoologiska Bidrag Fran Uppsala, Band 12, pp. 187-188, figs. 80-83.

Size. Male: Length, 6.8 to 7.4 mm.; width of pronotum, 4.3 to 5.0 mm.; width of abdomen, 4.2 to 4.9 mm. Female: Length, 8.0 to 8.1 mm.; width of pronotum, 5.3 mm.; width of abdomen, 5.4 mm.

Color. Dark brown to black, ventral side slightly lighter than dorsal surface, last four segments of male abdomen yellowish-brown with dark brown punctations. Last abdominal segment and anal flaps of female pale yellow. Posterior edge of segments of connexivum with a thin, pale yellow area. Intermediate and hind legs with two dark rings at middle of femur and three dark rings on tibia, one basal, one apical and one medial. Front legs light brown with dilation of femur and the trochanters lighter than the rest.

Structural Characteristics. Apex of head more or less pointedly projecting, apical tubercles rather slender, usually sharply pointed, appearing between superapical tubercles when viewing the specimen from above; a few small tubercles laterad of superapical tubercles. Pronotum widest at transverse furrow, not quite as wide as abdomen in the female, slightly wider than abdomen in the male; lateral margin of pronotum more or less rounded, anterior two-thirds to three-

fourths nearly straight, converging anteriorly, posterior fourth of lateral margin nearly straight, weakly oblique. Scutellum broad, rather large, without prominent tumescences. Hemelytra extending beyond tip of abdomen; embolium narrow, lateral margin nearly straight. Connexivum not very prominent, almost covered by the hemelytra, especially in the male. Bristles small, sparsely distributed on body on the specimens before the writer. Abdominal segments of the male asymmetrical; ninth ventral abdominal segment small, oval, wider than long, slightly longer than eighth abdominal segment; seventh abdominal segment roundly spatulate on right side; fifth abdominal segment very short medially. Ventral abdominal segments of the female asymmetrical; posterior margin of last abdominal segment roundly emarginated; a moderate tumescence on the left side, a faint tumescence on the right side of the last abdominal segment; a deep, elongate, transverse depression extending along the anterior margin of the last abdominal segment from the median line of the abdomen to the tumescence on the left side. Clasper of male swollen apically, a rather prominent projection at the middle of the medial surface, aedeagal furrow visible on apical half of ventral surface.

Location of Type. In the Museum of Stockholm, Stockholm, Sweden.

Distributional Data. Melin listed four specimens in his description of this species. One is from Guatemala City, Guatemala and is a female. The other three are labeled "Mexico," "Salle" and comprise the type series. The writer has examined the type and also a series of six specimens, three males and three females, from Tejupilco, Dist. of Temascaltepec, Mexico, June-July, 1933, H. E. Hinton.

Comparative Notes. Closely related to N. martini n. sp. but differing in the shape of the clasper of the male and having the emargination of the posterior margin of the last ventral abdominal segment of the female more rounded anteriorly than is the case in N. martini n. sp., and also differing in that the pronotum in this species is usually wider than or subequal to the width of the abdomen, while in N. martini n. sp. the pronotum is not as wide as the abdomen.

Nerthra martini n. sp.
(Pl. VII, fig. 2; Pl. IX, fig. 2; Pl. X, fig. 11)

Referring to this species:

1876. Mononyx badius Herrich-Schäffer; Uhler, Bull. U. S. Geol. Surv., pp. 336-337.

1894. Mononyx stygicus (Say); Uhler, Proc. California Acad. Sci., Ser. 2, Vol. IV, pp. 290-291.

Size. Male: Length, 7.0 to 7.6 mm.; width of pronotum, 4.5 to 4.8 mm.; width of abdomen, 4.5 to 5.0 mm. Female: Length, 7.8 to 8.8 mm.; width of pronotum, 4.8 to 5.3 mm.; width of abdomen, 5.0 to 5.8 mm.

Color. Varying from a yellowish-brown to black, generally a brown or reddish-brown. A whitish spot on each hemelytron mesad of the junction of the embolial and nodal sutures. In the black specimens the posterior third of the pronotum is generally spotted with pale yellow or white. Ventrally slightly lighter than dorsally; front femur uniform brown, intermediate legs light brown ringed with dark brown areas which may be faint in some specimens; last three abdominal segments lighter than rest of abdomen; connexivum with posterior third of each segment yellowish, anterior two-thirds dark. A few specimens examined were uniformly reddish-brown above and with a lighter marginal band ventrally which extended the entire length of the abdomen.

Structural Characteristics. Apex of the head pointedly projecting with a pair of rather sharp pointed tubercles at

the tip, sometimes these tubercles are rather rudimentary; superapical tubercles present. Pronotum not very dilated laterally; lateral edge nearly straight, occasionally weakly sinuous at middle; lateral edge conspicuously converging anteriorly; posterior margin sinuated before scutellum. Pronotum at greatest width not as wide as abdomen in either sex. Scutellum broad, rather large with slight tumescence on either side, mesad of which are two faint rounded depressions. Body sparsely covered with very small bristles, those on the scutellum being slightly clavate. Hemelytra well-developed extending beyond the apex of the abdomen. Lateral margin of embolium nearly straight, not dilated. Connexivum barely visible from a dorsal view in the male, quite prominent in the female because the posterior abdominal segments are greatly dilated laterally. Last abdominal segment of the male rather large, over half as wide as eighth abdominal segment, slightly longer than seventh or eighth abdominal segments, asymmetrical. Ventral abdominal segments of female asymmetrical; posterior margin of last abdominal segment more or less pointed notched; a moderate tumescence on the left side, a faint tumescence on the right side of the last abdominal segment; a deep, elongate, transverse depression extending along the anterior margin of the last abdominal segment from the median line of the abdomen to the tumescence on the left side. Clasper of male swollen apically; a weak

process on the lateral surface and another on the dorsal surface; aedeagal furrow visible on the apical half of the ventral surface.

Location of Type. Holotype male, allotype female, and 24 male and 2 female paratypes, Los Pensaguitos Cr., San Diego Co., California, Apr. 8, 1930, C. H. Martin, in the Francis Huntington Snow Entomological Collection at the University of Kansas. One male and one female paratypes, San Felipe Cr., California, Apr. 14, 1935, C. E. Norland, (Usinger Coll.). One male and one female paratypes, Los Angeles Co., California, no date, Coquillet, (USNM). One male and one female paratypes, Riverside, California, March 2, 1927, T. Craig, (CAS).

Distributional Data. In addition to the type series, the writer has seen specimens from the following localities:

California. Afton Canyon, San Bernardino Co., July 17, 1931, R. E. Blackwelder, 1 male, (CAS); Ardeou, Dec. 25, 1915, J. O. Martin, 1 female, (CAS); Los Angeles, no date, P. R. Uhler, 1 male, (USNM); Palm Canyon, Apr. 15, 1916, J. O. Martin, 1 male, (CAS): Palm Springs, Riverside Co., Apr. 3, 1925, E. C. Van Dyke, 1 male, (CAS); same place, Jan. 3, 1929, Van Dyke, 1 female; same place, Aug. 2, Hubbard, 1 female, (USNM); Panamint Vy., Apr. 1891, C. V. Riley, 2 females, (USNM); Pico, Mar. 7, 1916, J. O. Martin, 1 male and 1 female, (CAS); Pine Valley, July 27, 1938,

R. I. Sailer, 1 female; Santa Ana Canyon, July 12, 1931, C. H. Martin, 7 males and 3 females; Sierra Madre, June 7, 1930, C. H. Hicks, 2 males, (PAS); Sierra Nevada Mts., no date, P. R. Uhler, 1 male, (USNM).

Baja California: Big Cyn., Sierra Laguna, Oct. 13, 1941, Ross and Bohart, 2 males and 2 females, (CAS); Cataviña, June 19, 1938, Michelbacher and Ross, 1 male, (CAS); Las Animas, Sierra Laguna, Oct. 12, 1941, Ross and Bohart, 1 male and 2 females, (CAS); Las Parras, Oct., 1925, W. M. Mann, 1 male, (USNM); Loreto, Feb., 1923, W. M. Mann, 2 males and 3 females, (USNM); 19 mi. E. Rosario, June 17, 1938, Michelbacher and Ross, 3 males, (CAS); "L. Cal.", no date, P. R. Uhler, 1 male, (USNM).

Arizona. "Ariz.", no date, P. R. Uhler, 1 male (USNM); "Ariz.", no date, C. F. Baker, 1 male and 1 female, (USNM).

Georgia: Dayton, July 9, 1926, J. R. Delano, 2 females, (PAS),*(labelled Dayton, Ga.).

Comparative Notes. This species is very closely related to N. mexicana Melin and to N. stygica Say. It is separated from the former species by the narrow pronotum, slightly larger size, the notch of the posterior margin of the last abdominal segment of the female being rather pointed at the anterior end and by the shape of the clasper of the male. It differs from N. stygica Say in that it has separate

---

*I have not been able to locate a Dayton, Georgia, a Dayton, California, or Dayton, Guatemala.

hemelytra with well-developed membranes, the emargination of the last abdominal segment of the female slightly more pointed, and in the shape of the male genitalia. It is interesting to note that all the specimens of N. stygica Say have been taken during the winter or early spring. If the specimens collected by J. R. Delano are from Georgia, then there is a possibility that Nerthra stygica Say is a winter form of this species. This writer had considered this possibility before receiving the specimens from the Philadelphia Academy of Science. In fact, he accompanied Doctor. R. H. Beamer on a collecting trip throughout the Gulf States during the summer of 1948, hoping to find specimens of N. mexicana Melin or N. martini n. sp. The trip was unsuccessful as far as this purpose was concerned. However, Doctor Beamer did find fragments of a specimen of Nerthra stygica Say on the shore of Apalachicola Bay, Florida. Further collecting and the knowledge of the life histories will be necessary before the true relationships of these three species may be determined.

This species is named after Doctor C. H. Martin, who collected the types located in the Francis Huntington Snow Entomological Collection.

Nerthra fuscipes (Guérin-Méneville)

(Pl. VII, fig. 12; Pl. VIII, fig. 9;
Pl. IX, fig. 8; Pl. X, fig. 9)

1843. Mononyx fuscipes Guérin-Méneville, Revue Zoologique Travaux Inedits, p. 114.

1863. M. fuscipes Guérin-Méneville; Stål, Berliner Entomologische Zeitschrift, VII, p. 406.

1876. M. fuscipes Guérin-Méneville; Stål, Kongl. Svenska Vetenskaps-Akademiens Handlingar, Band 14, No. 4, p. 138.

1886. M. fuscipes Guérin-Méneville; Uhler, Bull. Brooklyn Ent. Soc., p. 27.

1895. M. fuscipes Guérin-Méneville; Pittier and Biolley, Inst. fisico geografico Nacional (Costa Rica), p. 23.

1899. M. fuscipes Guérin-Méneville; Montandon, Bulletin de la Société des Sciences de Bucarest-Roumanie, An. VIII, No. 4 et 5, p. 392.

1901. M. fuscipes Guérin-Méneville; Champion, Biologia Centrali-Americana, Rhynchota Heteroptera, Vol. II, p. 348.

1906. M. fuscipes Guérin-Méneville; Torre-Bueno, Ent. News, Vol. 17, p. 54.

1909. M. fuscipes Guérin-Méneville; Kirkaldy and Torre-Bueno, Proc. Ent. Soc. Washington, Vol. X, p. 180.

1917. M. fuscipes Guérin-Méneville; Van Duzee, Catalogue of Hemiptera, Univ. California Publ., p. 474.

1925. M. fuscipes Guérin-Méneville; Blatchley, Ent. News, Vol. 36, p. 52.

1929. M. fuscipes Guérin-Méneville; Melin, Zoologiska Bidrag Fran Uppsala, Band 12, p. 181, figs. 58-61.

Also referring to this species:

1853. Mononyx badius Herrich-Schäffer, Die Wanzenartigen Insecten, IX, p. 28, fig. 896.

1862. M. badius Herrich-Schäffer; Stål, Stettiner Entomologische Zeitschrift, XXXII, p. 459.

1873. M. badius Herrich-Schäffer; Walker, Catalogue of Hemiptera in British Museum, Part VIII, p. 172.

1876. M. badius Herrich-Schäffer; Uhler, Bull. U. S. Geol. Surv., Vol. I, No. 5, p. 337.

1854. Mononyx obscurus Stål, Ofversigt af Kongl. Vetenskaps-Akademiens Fordhandlingar, Arg. 11, p. 239.

1873. M. obscurus Stål; Walker, Catalogue of Hemiptera in the British Museum, Part VIII, p. 172.

Size. Male: Length, 8.2 to 10.0 mm.; width of prondtum, 5.2 to 6.4 mm.; width of abdomen, 5.2 to 6.5 mm. Female: Length, 8.8 to 11.0 mm.; width of pronotum, 5.6 to 6.6 mm.; width of abdomen, 5.7 to 6.8 mm.

Color. Light brown to dark blackish-brown; posterior margins of the segments of the connexivum pale yellowish-brown; two thin blackish-brown spots on the sinuated part of the posterior margin of the pronotum. Ventral surface usually entirely dark brown or with the median part of abdominal segments, posterior lateral angles of the abdominal segments and the apex of the intermediate and hind femora pale yellowish-brown.

Structural Characteristics. Apex of the head more or less concavely excavated, a rather broad tubercle on either side of the excavation; lateral tubercles small, generally forming a toothlike protuberance between the eye and the apex of the head. Pronotum widest at the level of the transverse

furrow, not quite as wide as the abdomen; lateral margins quite variable, median part may be rounded, concave or straight, most specimens are of the latter type; posterior margin sinuated before the scutellum. Scutellum rather large, slightly elevated, depressed at the basal angles. Hemelytra extending beyond the end of the abdomen; lateral margin of the embolium usually weakly convex. Connexivum barely visible in the males, moderately prominent in the females. Ventral abdominal segments of the female nearly symmetrical; last abdominal segment with the posterior margin medianly rather shallowly notched. Anal flaps small, about as wide as long. Ventral abdominal segments of the male asymmetrical; ninth segment small, oval in shape; eighth segment twice as long as the ninth segment. Clasper of the male very characteristic, two processes extending mesad from the medial surface.

Location of Type. Unknown. Doctor H. B. Hungerford noted that there are five specimens in the Museum of Paris labeled "Colombie, Lebas, 1830." It is quite possible that these specimens are the type series, but they apparently are not marked as types.

Distributional Data. This species was described from a specimen or specimens from Columbia. To present the distribution as given in the literature would be useless in consideration of the fact that no less than five species have been included in this species by previous workers. Specimens

of N. fuscipes (Guérin-Méneville) before this worker are from the following localities:

Mexico: Chichen Itza, Yucatan, Aug. 29, 1936, H. D. Thomas, 1 male; Motzorongo, Vera Cruz, Jan., 1892, H. Osborn, 1 male, (USNM); Orizaba, Jan. 17, 1908, F.Knab, 4 males, (USNM); Orizaba, Vera Cruz, Jan. 9-16, 1892, H. Osborn, 1 male, (USNM); Otozac, Nov., 1887, L. Bruner, 1 male, (USNM); "Mexico," no date, Storkan, 1 male, (Mus. Prague).

Guatemala: Cobán, Alta Vera Paz, May 22, 1926, J. M. Aldrich, 1 male, (USNM); Morales, Dec., 1929, J. J. White, 3 males, (PAS); Secanquin, Alta Vera Paz, Jan. 4, 1905, A. Mac Laklan, 1 male, (USNM).

Costa Rica: La Carpintera, Apr., 1924, W. M. Mann, 1 male, (USNM); San Carlos, no date, Schild Bugdorf, 1 male, (USNM).

Honduras: Progresso, Mar. 8, 1923, T. H. Hubbell, 2 females; San Pedro, Sula, no date, W. M. Mann, 1 male, (USNM).

Salvador: La Libertad, Jan. 24, 1930, T. O. Zschokke, 1 female, (CAS).

Panama: Albrook Field, Canal Zone, Nov. 5, 1937, R. Bliss, 1 male and 1 female, (PAS); Ancón, Canal Zone, May 15 -28, 1918, J. Zetek, 1 male, (USNM); Barro Colorado I., Canal Zone, Nov. 22, 1944, K. E. Frick, 1 male, (CAS); same place, Dec., 1946 to Feb., 1947, J. Zetek, 1 male, (USNM); Boquete, Chiriquí Prov., Mar. 7, 1923, F. M. Gaige, 1 female;

Canal Zone, Feb., 1923, C. V. Riley, 1 male, (USNM); Cano Saddle, Gatún L., Aug. 6, 1923, R. C. Shannon, 1 male, (USNM); Chilibrillo Caves, Apr. 30, 1945, K. E. Frick, 1 female, (CAS); Colom (Colón?), "Casey bequest 1925," 1 male, (USNM); Corozal, May 12, 1937, R. Bliss, 1 male, (PAS); Fort Clayton, Canal Zone, Feb., 1945, K. E. Frick, 1 male, (CAS); Fort Kobbe Rd., Canal Zone, May 19, 1937, R. Bliss, 1 female, (PAS); Gatún, Canal Zone, Mar., 1930, T. O. Zschokke, (CAS); same place, no date, A. H. Jennings, 1 male, (USNM); Gatún Dam, C. Z., Apr. 13, 1930, T. O. Zschokke, 2 males and 1 female, (CAS); Gatún Lake, Aug. 16, 1931, T. O. Zoschokke, 2 males, (CAS); Paraiso, C. Z., June 5, 1911, A. Busck., 1 male, (USNM); same place, no date, A. H. Jennings, 1 male, (USNM); "Pan.," no date, P. R. Uhler, 1 male, (USNM).

Columbia: Palmira, May, 1943, B. Losada S., 1 male, (USNM).

Brasil: "Rio de Jan.," Oct., no collector, 1 male, (Car. Mus.).

Puerto Rico: Ponce, July 10, 1928, L. F. Con., 1 male, and 2 females, (PAS).

Comparative Notes. While the original description of this species is not sufficient to determine accurately this species, the description of Montandon, 1899, and specimens which were determined by him, make it quite clear as to what he considered to be N. fuscipes (Guérin-Méneville). Since

it is quite possible that Montandon knew Guérin-Méneville's species, this worker decided to follow Montandon in regard to the recognition of this species. However, an examination of the male genitalia soon revealed that what Montandon and other workers had considered one species was actually a closely related complex of at least four species. The question therefore arises as to which of these is N. fuscipes Guérin-Méneville). This, of course, could be easily settled provided the five specimens in the Museum of Paris are the types and provided that one of them is a male. For the present, this worker must base his decision upon geographical distribution. Of the four species, only one species is represented by specimens from as far south as Columbia. This species I am calling N.fuscipes (Guérin-Méneville).

This species is most closely related to N. manni n. sp. and can be separated from that species only by the male genitalia. While the latter species appears to occur mainly in Western Mexico, the ranges appear to overlap at the Isthmus of Tehuantepec. Because of this overlap, females from Eastern Mexico, Southern Mexico and Guatemala were not included in the distributional data of either species.

Nerthra manni n. sp.

(Pl. VII, fig. 14; Pl. VIII, fig. 12;
Pl. IX, fig. 12)

Size. Male: Length, 9.1 to 10.2 mm.; width of pronotum, 5.6 to 6.1 mm.; width of abdomen, 5.6 to 6.3 mm. Female: Length, 8.8 to 11.0 mm.; width of pronotum, 5.6 to 6.6 mm.; width of abdomen, 5.7 to 6.8 mm.

Color. Light brown to dark blackish-brown; posterior margins of the segments of the connexivum pale yellowish-brown; darker irregular spots on the posterior margin of the pronotum; ventral surface usually entirely dark brown or with the median part of abdominal segments, posterior angles of the abdominal segments, and the apex of the intermediate and hind femora pale yellowish-brown.

Structural Characteristics. Apex of the head more or less concavely excavated, a rather broad tubercle which is variable in size on either side of the excavation; lateral tubercles generally forming a tooth-like protuberance between the eye and the apex of the head, but sometimes a few are separate between the protuberance and the tubercle that is laterad of the apical excavation; ocelli present. Pronotum widest at the level of the transverse furrow, not quite as wide as abdomen, although this may vary with some specimens; lateral margins variable, median part in particular, either slightly rounded, straight or weakly concave; posterior

margin sinuated before the scutellum. Scutellum rather large, slightly elevated, depressed at the basal angles. Hemelytra extending beyond the end of the abdomen in normal specimens; lateral margin of the embolium usually weakly convex. Connexivum barely visible in the males, moderately prominent in the females. Ventral abdominal segments of the female nearly symmetrical; last abdominal segment with the posterior margin medially rather shallowly notched. Anal flaps small, about as wide as long. Ventral abdominal segments of the male asymmetrical; ninth segment small, about half as long as the eighth segment. Clasper of the male with one large process or projection on the medial surface, the medial basal angle of the projection deeply sinuate.

Location of Types. Holotype male and allotype female, Taxco, Guerrero, Mexico, Oct., 1946, J. G. Shaw; 1 male paratype, La Sabana, Guerrero, Mexico, kil. 226 S. Mexico City, Oct. 20, 1936, H. D. Thomas; 3 male and 9 female paratypes, Tejupilco, District of Temascaltepec, Mexico, June-July, 1933, H. E. Hinton in the Francis Huntington Snow Entomological Collections at the University of Kansas. One male and 2 female paratypes, Tejupilco, Dist. Temascaltepec, Mexico, June 24, 1933, R. L. Usinger and H. E. Hinton; 1 male paratype, Bejucos, Dist. of Temascaltepec, Mexico, July 3, 1933, H. E. Hinton and R. L. Usinger in the R. L. Usinger Collection. One male paratype, Cuernavaca, Morales, Mexico,

July, 1945, N. L. H. Krauss; 9 male and 7 female paratypes, Las Barancas, Mexico, Mar., 1923, W. M. Mann; 13 male and 7 female paratypes, Above Tepic, Nayarit, Mexico, Mar., 1923, W. M. Mann in the United States National Museum at Washington, D. C. One male paratype, Cuernavaca, Morales, Mexico, Nov. 19, 1946, E. S. Ross; 1 male paratype, 3 miles S. Acahuizotla, Guerrero, Mexico, Nov. 17, 1946, E. S. Ross; 1 female paratype, Alamos, Sonora, Mexico, Oct. 2, 1923, H. S. Gentry in the collections of the California Academy of Science at San Francisco, California.

Distributional Data. This species appears to be restricted to Mexico, particularly to the western states. It may also possibly occur in the extreme southern portions of California and Arizona since I have seen a specimen from Sonora, Mexico (paratype in the California Academy of Science's collection). I have also seen a female specimen which was taken from the crop of a chicken in Nogales, Arizona. There is no way of knowing where the chicken came from, however, the state of preservation of the specimen would indicate that it had not been in the chicken's crop very long. This specimen is in the Francis Huntington Snow Entomological Collections at the University of Kansas.

Comparative Notes. This species can be separated from N. fuscipes (Guérin-Méneville) only by the male genitalia. In this species there is a single large medial process while

in the latter species there are two smaller medial processes.

This species could have been Herrich-Schäffer's Mononyx badius or Stål's M. obscurus, however, since this species is apparently rather restricted to western Mexico, I rather doubt that it was either. The type of the former is apparently lost and while the type of the latter may be with other types of Stal in the Museum of Stockholm, Stockholm, Sweden. If it is located there, Melin, 1929, does not mention it.

This species is named for W. M. Mann, who collected many specimens not only of this species but of many other species in this family.

Nerthra hungerfordi n. sp.
(Pl. VII, fig. 11; Pl. VIII, fig. 6;
Pl. IX, fig. 10)

Size. Male: Length, 7.5 to 9.0 mm.; width of pronotum, 5.0 to 5.8 mm.; width of abdomen, 5.0 to 5.9 mm. Female: Length, 8.1 to 9.4 mm.; width of pronotum, 5.5 to 6.0 mm.; width of abdomen 5.8 to 6.4 mm.

Color. Brown to almost black; posterior margin of the pronotum with indistinct alternating black and yellowish-brown spots; connexivum either entirely dark or with a thin yellowish-brown or orange area at the posterior margins of the segments; ventrally mostly dark brown; the fore legs reddish-black; yellowish-brown spots present on the apex of the intermediate and hind femora and on the abdominal segments.

Structural Characteristics. Apex of the head more or less concavely excavated, with a tubercle on either side of the excavation; lateral tubercles irregular in size and position, sometimes forming a tooth-like protuberance between the eye and the apex of the head. Pronotum widest at the level of the transverse furrow, not as wide as abdomen in the female, about as wide as the abdomen in the male; lateral margins slightly variable in the specimens studied, generally with the median part nearly straight and parallel to the longitudinal axis of the body, anterior

third roundly curved to the eye, posterior fourth straight to slightly concave running mesad in an oblique manner to the base of the embolium; posterior margin sinuated before the scutellum. Scutellum rather large, sides and apex slightly tumescent. Hemelytra extending beyond the end of the abdomen in the males, in the females extending to the end or slightly shorter than the abdomen; embolium with lateral margin moderately convex. Connexivum barely visible in the males, moderately so in the females. Body covered by very thin, rather long black bristles. Ventral abdominal segments of the female nearly symmetrical; posterior margin of the last segment medially shallowly emarginated. Anal flaps about as wide as long. Ventral abdominal segments of the male asymmetrical; ninth segment small, about half as long as the eighth segment; eighth segment over half as wide as fifth abdominal segment. Clasper of the male somewhat resembling that of N. fuscipes (Guérin-Méneville), but with the dorsal surface more irregular, a small dorsal projection present near the bend of the clasper and the medial projections closer to each other.

Location of Type. Holotype male, allotype female, and 1 male and 8 female paratypes, "Río Virilla", Costa Rica, Dec. 26, 1931, H. Schmidt; 8 male and 9 female paratypes, San José, Costa Rica, 1932, H. Schmidt; in the Francis Huntington Snow Entomological Collection at the University of Kansas. In addition to the above series, there is 1 male

and 1 female paratypes, San José, Costa Rica, 1928, M. Valerdo, in the United States National Museum at Washington, D. C.; 1 male paratype, Finca, El Cipres, Suchitepequez Prov., Guatemala, no date, J. R. Slevin, in the Collection of the California Academy of Science at San Francisco, California; and, 1 male paratype, Boquete, Chiriquí Prov., Panamá, Mar. 2, 1923, F. M. Gaige, in the Collection of the University of Michigan at Ann Arbor, Michigan.

Distributional Data. Besides the types mentioned above, the writer has studied specimens from the following localities:

Guatemala: Alta Vera Paz, Apr. 30, Schwarz and Barber, 1 male, (USNM).

Nicaragua: "Nicarag.", no date, P. R. Uhler, 1 male, (USNM).

British Honduras: Belize River, Mar. 14, 1922, H. F. Loomis, 1 male, (USNM).

Honduras: Tela, May 23, 1923, T. H. Hubbell, 1 female.

Salvador: La Libertad, Jan. 24, 1930, T. D. Zschokke, 1 female, (CAS); San Andrés, July 25, 1944, E. J. Hambleton, 1 female, (USNM); San Salvador, May 26, 1925, K. A. Salman, 2 males, (USNM).

Costa Rica: Estrella, no date or collector, 1 male, (USNM); "Río Virilla", Costa Rica, June to July, 1931, 1 male and 3 females; "Costa Rica," no date, C. F. Baker, 1 female, (USNM).

Comparative Notes: This species is closely related to N. fuscipes (Guérin-Méneville) and N. manni n. sp., but it can be separated from these two species in the case of the males by the shape of the clasper, by the fact that the eighth ventral abdominal segment of the male is more than half as wide as the fifth ventral abdominal segment, and by the slightly smaller size. I name this species after Doctor H. B. Hungerford, under whose supervision this investigation was made.

Nerthra bracchialis n. sp.

(Pl. VII, fig. 5; Pl. IX, figs. 3, 11)

Size. Length 7.0 to 7.7 mm.; width of pronotum, 4.5 to 4.7 mm.; width of abdomen, 4.8 mm. Female: Length, 8.0 mm.; width of pronotum, 5.1 mm.; width of abdomen, 5.2 mm.

Color. Brown to blackish-brown; posterior part of the segments of the connexivum in the female thinly yellow; ventrally mostly dark brown with yellowish-brown spots on the intermediate and hind legs and on the absomen.

Structural Characteristics. Apex of the head more or less concavely excavated, a stout tubercle on each side of the excavation; lateral tubercles of the head forming a tooth-like protuberance between the eye and the apex of the head. Pronotum widest at a level with the transverse furrow, slightly less in width than the abdomen; lateral margins more or less rounded; posterior margin before scutellum sinuated. Scutellum large, slightly elevated. Hemelytra extending to or beyond the end of the abdomen; embolium with the lateral margin slightly convex. Connexivum barely visible in the male, prominent in the female. Ventral abdominal segments of male asymmetrical; ninth segment small, oval in shape, about half as long as eighth segment; eighth segment about half as wide as fifth segment. Ventral abdominal segments of the female nearly symmetrical; posterior

margin of last segment shallowly notched medially. Anal flaps about as wide as long. Clasper of the male characteristic; a large projection on the medial surface, medial basal angle of the projection rounded.

Location of Type. Holotype male, Mazatlán, Mex., P. R. Uhler Coll. in the United States National Museum at Washington, D. C. Allotype female, Real de Arriba, Dist. of Temascaltepec, Mexico, VII- 6- 33, H. E. Hinton & R. L. Usinger; one male paratype, Tejupilco, Dist. of Temascaltepec, Mexico, VI- 24- 33, H. E. Hinton & R. L. Usinger in the R. L. Usinger Collection.

Distributional Data. As given above for the type series.

Comparative Notes. This species may be separated from the other three species of this closely related group by the male clasper and the smaller size.

LITERATURE CITED

1. Billberg, G. J. (1820). Enumeratio Insectorum in Museo Billberg. Holm. 138 pp.

2. Blatchley, W. S. (1925). Some Additional New Species of Heteroptera from Southern United States, with Characterization of a New Genus. Entomological News, Vol. 36, pp. 49-52.

3. Champion, G. C. (1901). Biologia Centrali-Americana, Rhynchota Heteroptera. Vol. 2, 416 pp.

4. Darlington, P. J. (1948). The Geographical Distribution of Cold-blooded Vertebrates. The Quaterly Review of Biology, Vol. 23, Nos. 1 and 2, pp. 1-26, 105-123.

5. Fabricius, J. C. (1798). Supplementum Entomologiae Systematicae. Hafniae. Proft et Storch. 572 pp.

6. Guérin-Méneville, F. E. (1844). Note sur la Naucoris rugosa de J. Desjardins, formant un nouveau genre d'Hémiptères, et description de plusiers especes des genres Pelogonus et Mononyx. Revue Zoologique Travaux Inedits, pp. 112-114.

7. Hungerford, H. B. (1922). The Life History of the Toad Bug. University of Kansas Science Bulletin, Vol. 14, pp. 145-171.

8. Kevan, D. K. McE. (1942). Some Observations on Mononyx neapeformis (Fabricius). Proceedings of the Royal Entomological Society of London (a) 17, pts. 10-12, pp. 109-110.

9. Kirkaldy, G. W. (1897). Synonymic Notes on Aquatic Rhynchota. The Entomologist, Vol. 30, p. 258.

10. Laporte, F. L. de. (1833). Essai d'une Classification Systematique de L'order des Hémiptères. Paris. 88 pp.

11. Martin, C. H. (1929). An Exploratory Survey of Characters of Specific Value in the Genus Gelastocoris Kirkaldy and Some New Species. University of Kansas Science Bulletin, Vol. 18, No. 4, pp. 351-369.

12. Maxwell-Lefroy, H. (1909). Indian Insect Life. Calcutta and Simla. Thacker, Spink & Col 786 pp.

13. Melin, D. (1929). Hemiptera from South and Central America I. (Revision of the genus Gelastocoris and the American species of Mononyx). Zoologia Bidrag Fran Uppsala, Band 12, pp. 151-194.

14. Millspaugh, D. C. (1939). Bionomics of the Aquatic and Semi-aquatic Hemiptera of Dallas County, Texas. Field and Laboratory, Vol. 7, No. 2, pp. 82-83.

15. Nelson, H. G. (1949). A Method of Cleaning Insects for Study. The Coleopterist's Bulletin, Vol. 3, No. 6, pp. 89-92.

16. Say, T. (1832). Descriptions of New Species of Heteropterus Hemiptera of North America. New Harmony, Ind. 39 pp.

17. Stål, C. (1861). Nova methodus familias quasdam Hemiptera disponendi. Ofversigt af Kongliga Vetenskaps Akademiens Fordhandlingar, Arg. 18, pp. 195-212.

18. Stål, C. (1876). Enumeratio Hemipterorum. Kongliga Svenska Vetenskaps-Akademiens. Handlingar, Band 14, No. 4, pp. 137-140.

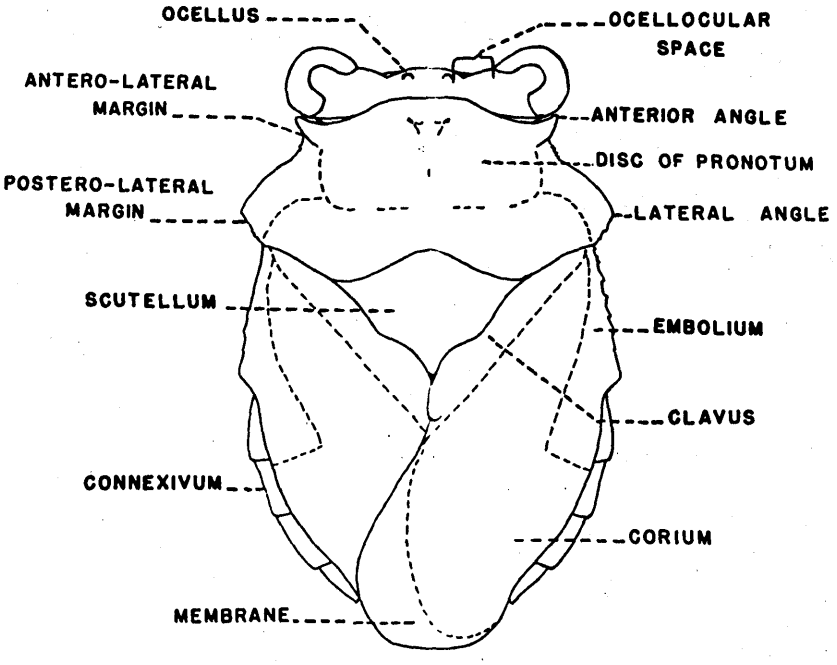
19. Torre-Bueno, J. R. de la. (1906). On Some Aquatic Hemiptera from Costa Rica, Central America. Entomological News, Vol. 17, p. 54.

PLATE I

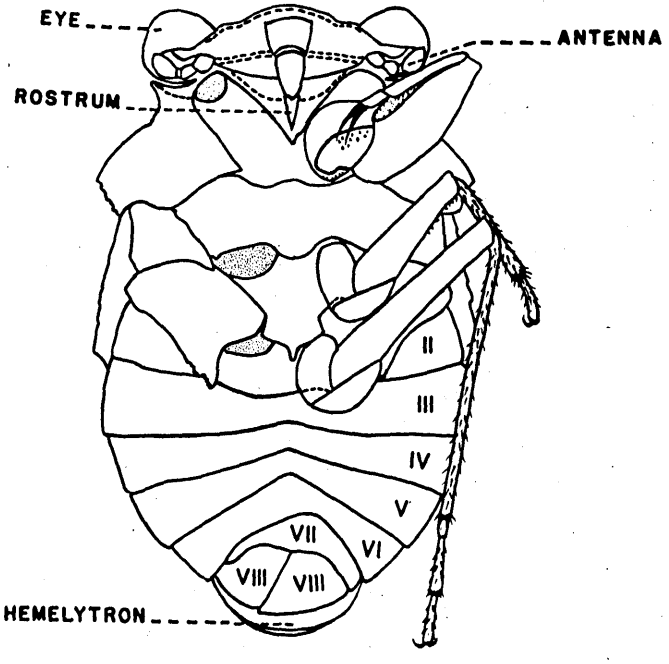
Fig. 1. G. oculatus (Fabricius). Dorsal view. ♂ X15

Fig. 2. G. oculatus (Fabricius). Ventral view. ♂ X15

PLATE I


OCELLUS
OCELLOCULAR SPACE
ANTERO-LATERAL MARGIN
ANTERIOR ANGLE
DISC OF PRONOTUM
POSTERO-LATERAL MARGIN
LATERAL ANGLE
SCUTELLUM
EMBOLIUM
CLAVUS
CONNEXIVUM
CORIUM
MEMBRANE

1.


EYE
ANTENNA
ROSTRUM
II
III
IV
V
VII
VI
VIII
VIII
HEMELYTRON

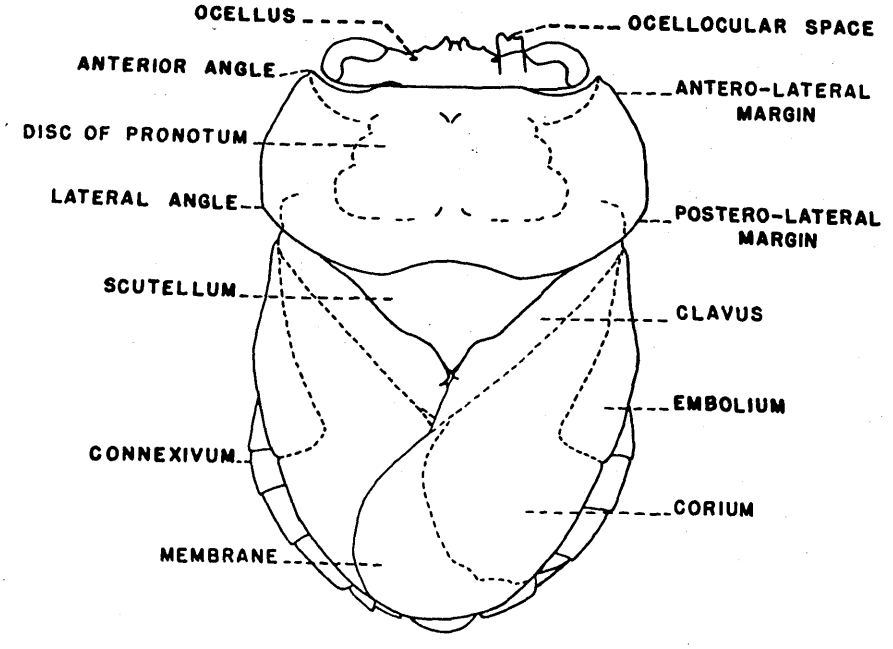
2.

PLATE II

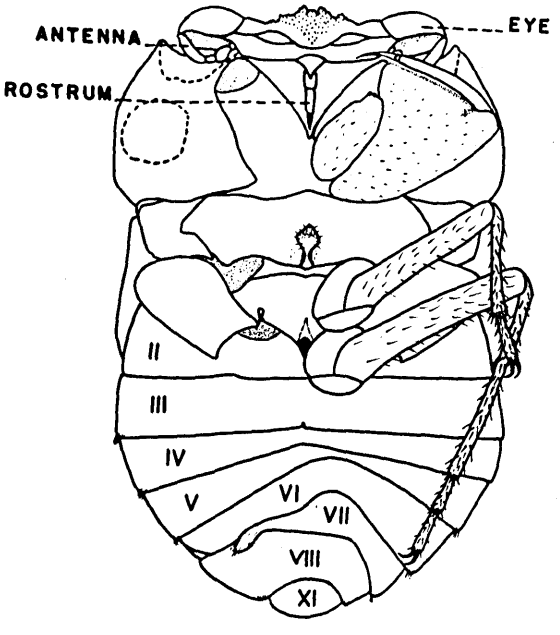
Fig. 1. *N. ranina* (Herrich-Schäffer). Dorsal view. ♂ X15

Fig. 1. *N. ranina* (Herrich-Schäffer). Ventral view. ♂ X15

PLATE II


OCELLUS
OCELLOCULAR SPACE
ANTERIOR ANGLE
ANTERO-LATERAL MARGIN
DISC OF PRONOTUM
LATERAL ANGLE
POSTERO-LATERAL MARGIN
SCUTELLUM
CLAVUS
EMBOLIUM
CONNEXIVUM
CORIUM
MEMBRANE

1.


ANTENNA
EYE
ROSTRUM
II
III
IV
V
VI
VII
VIII
XI

2.

PLATE III

Fig. 1. G. oculatus (Fabricius). Antenna. X90

Fig. 2. N. ranina (Herrich-Schäffer). Antenna. X90

Fig. 3. N. raptoria (Fabricius). Portion of foreleg. X15

Fig. 4. G. oculatus (Fabricius). Foreleg. X30

Fig. 5. N. ranina (Herrich-Schäffer). Foreleg. X30

Fig. 6. N. buenoi n. sp. Portion of foreleg. X15

PLATE III

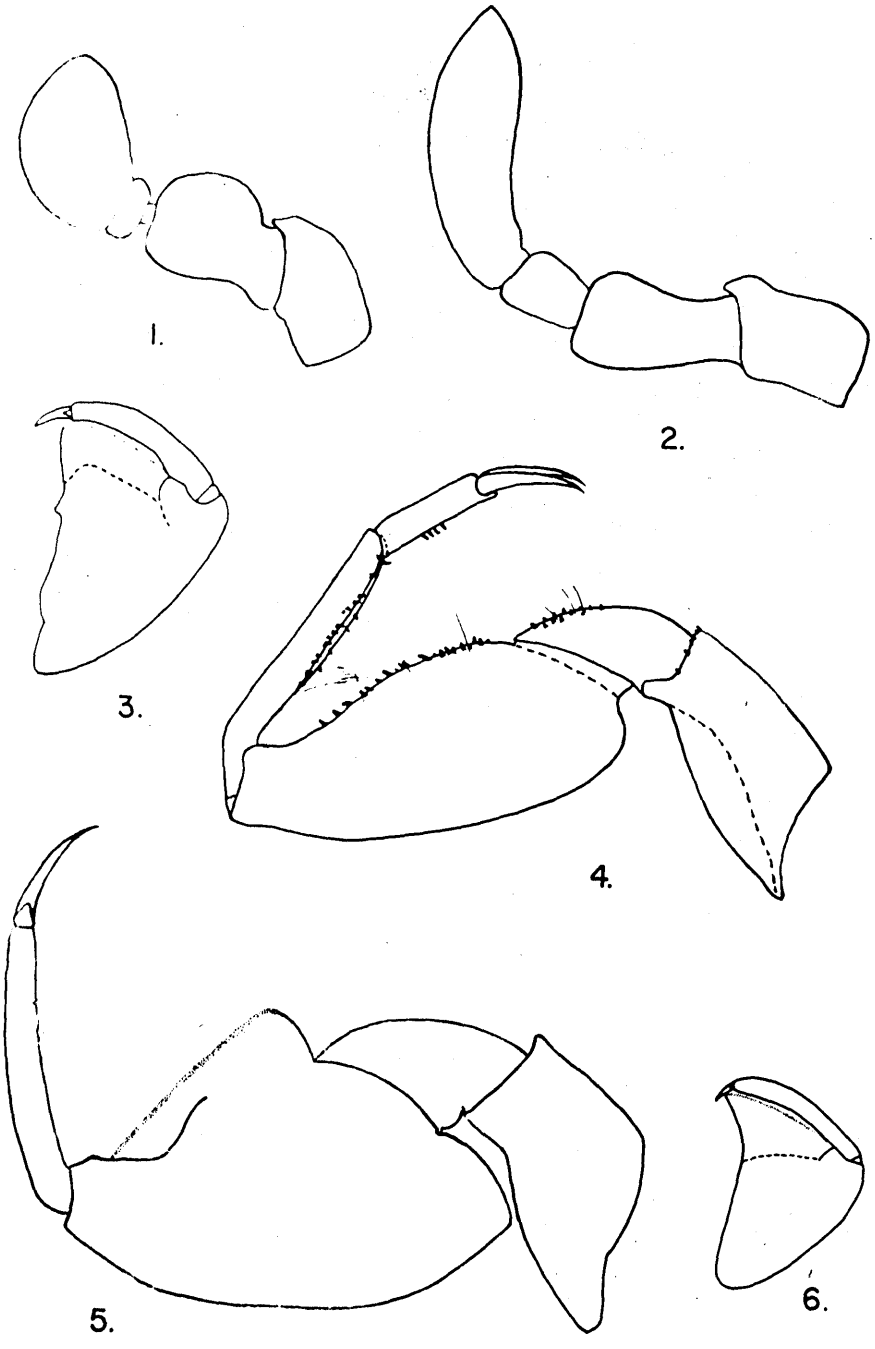


PLATE IV

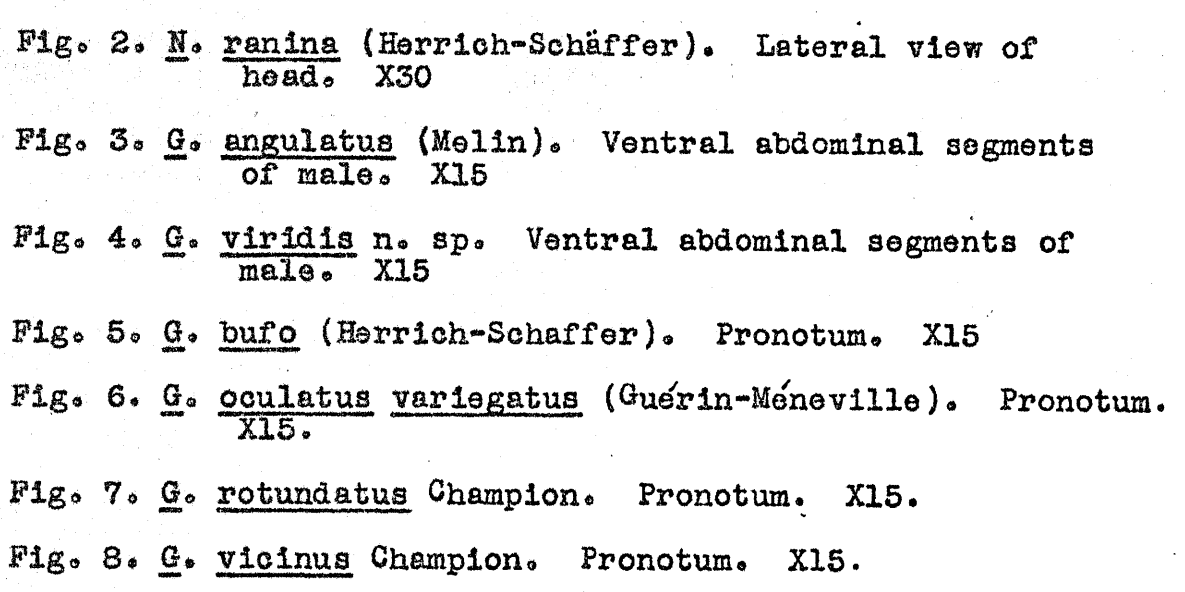


Fig. 1. G. oculatus (Fabricius). Lateral view of head. X30

Fig. 2. N. ranina (Herrich-Schäffer). Lateral view of head. X30

Fig. 3. G. angulatus (Melin). Ventral abdominal segments of male. X15

Fig. 4. G. viridis n. sp. Ventral abdominal segments of male. X15

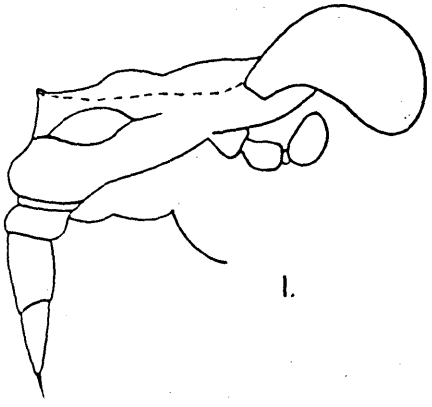
Fig. 5. G. bufo (Herrich-Schaffer). Pronotum. X15

Fig. 6. G. oculatus variegatus (Guérin-Méneville). Pronotum. X15.

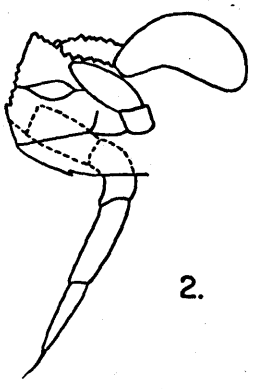
Fig. 7. G. rotundatus Champion. Pronotum. X15.

Fig. 8. G. vicinus Champion. Pronotum. X15.

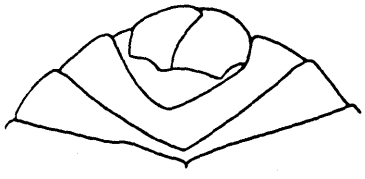
PLATE IV



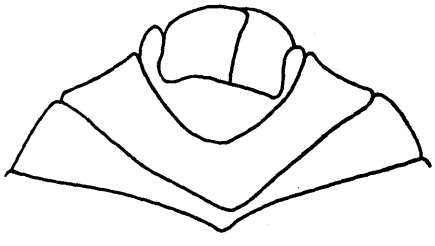
1.



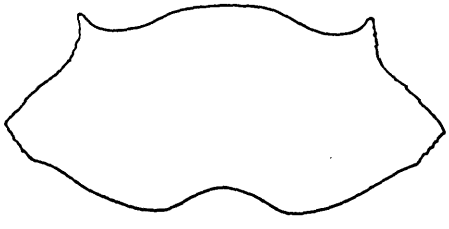
2.



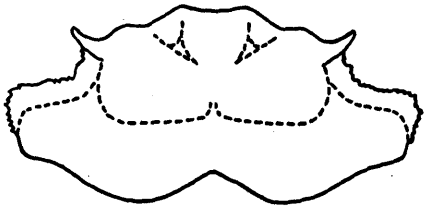
3.



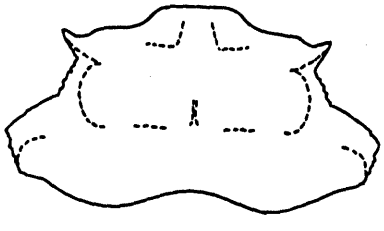
4.



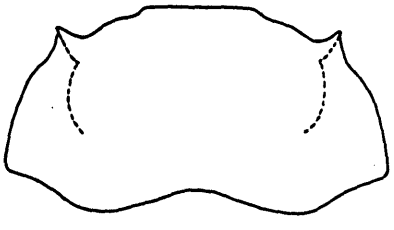
5.



6.



7.



8.

PLATE V

Fig. 1. G. hungerfordi Melin. Pronotum. X15

Fig. 2. G. fuscus Martin. Pronotum. X15

Fig. 3. G. andinus Melin. Pronotum. X15

Fig. 4. G. amazonensis Melin. Pronotum. X15

Fig. 5. G. viridis n. sp. Pronotum. X15

Fig. 6. G. flavus (Guérin-Méneville). Pronotum. X15

Fig. 7. G. angulatus (Melin). Pronotum. X15

Fig. 8. G. peruensis Melin. Pronotum. X15

Fig. 9. G. oculatus (Fabricius). Male genitalia. X45

Fig. 10. G. angulatus (Melin). Male genitalia. X45

Fig. 11. G. oculatus (Fabricius). Left clasper. X90

PLATE V

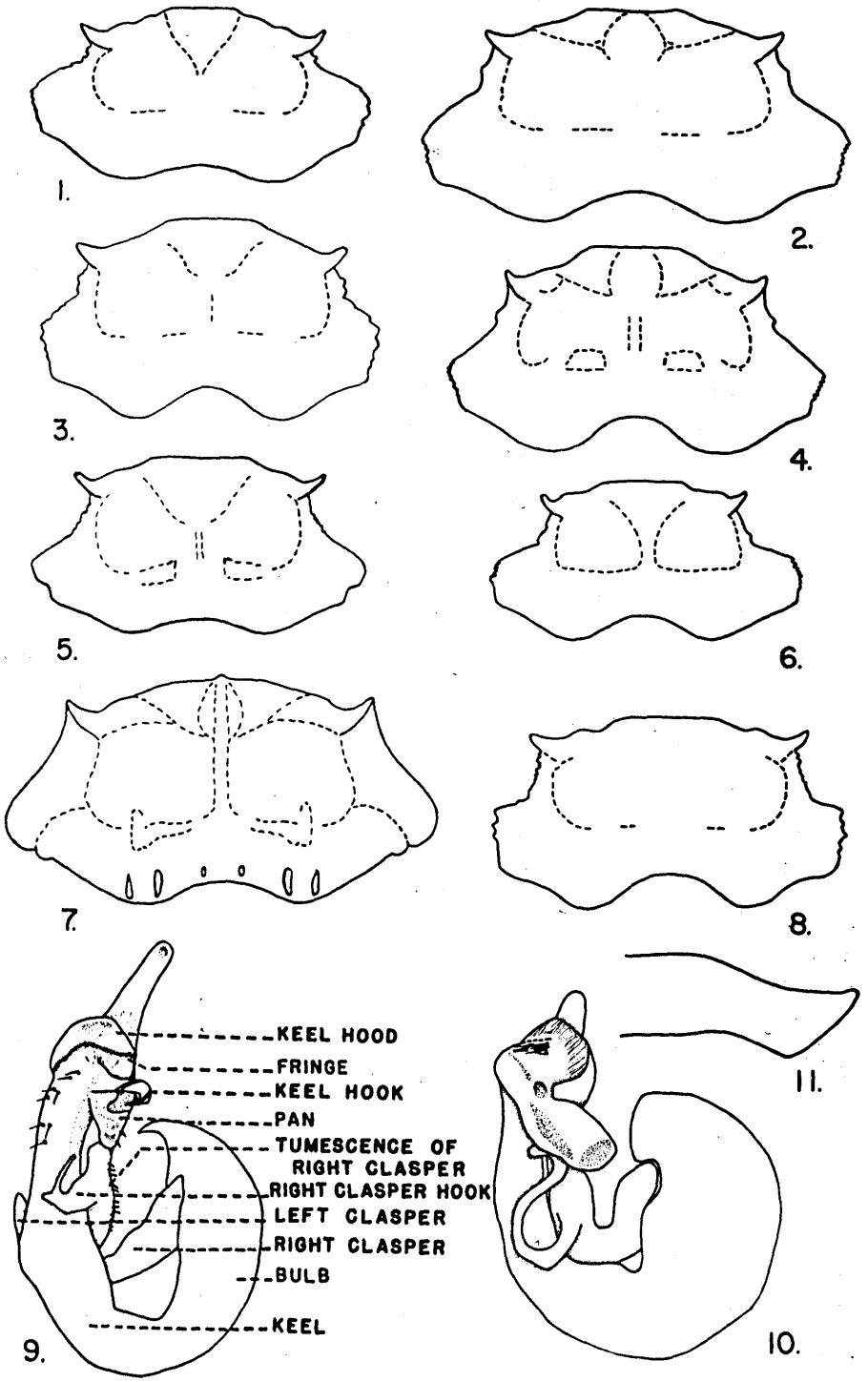

1.
2.
3.
4.
5.
6.
7.
8.
KEEL HOOD
FRINGE
KEEL HOOK
PAN
TUMESCENCE OF RIGHT CLASPER
RIGHT CLASPER HOOK
LEFT CLASPER
RIGHT CLASPER
BULB
KEEL
9.
10.
11.

PLATE VI

Male Genitalia X45

Fig. 1. G. rotundatus Champion.

Fig. 2. G. oculatus variegatus (Guérin-Méneville).

Fig. 3. G. vicinus Champion.

Fig. 4. G. hungerfordi Melin.

Fig. 5. G. bufo (Herrich-Schäffer).

Fig. 6. G. flavus (Guérin-Méneville).

Fig. 7. G. amazonensis Melin.

Fig. 8. G. viridis n. sp.

Fig. 9. G. peruensis Melin.

Fig. 10. G. andinus Melin.

Fig. 11. G. fuscus Martin.

PLATE VI

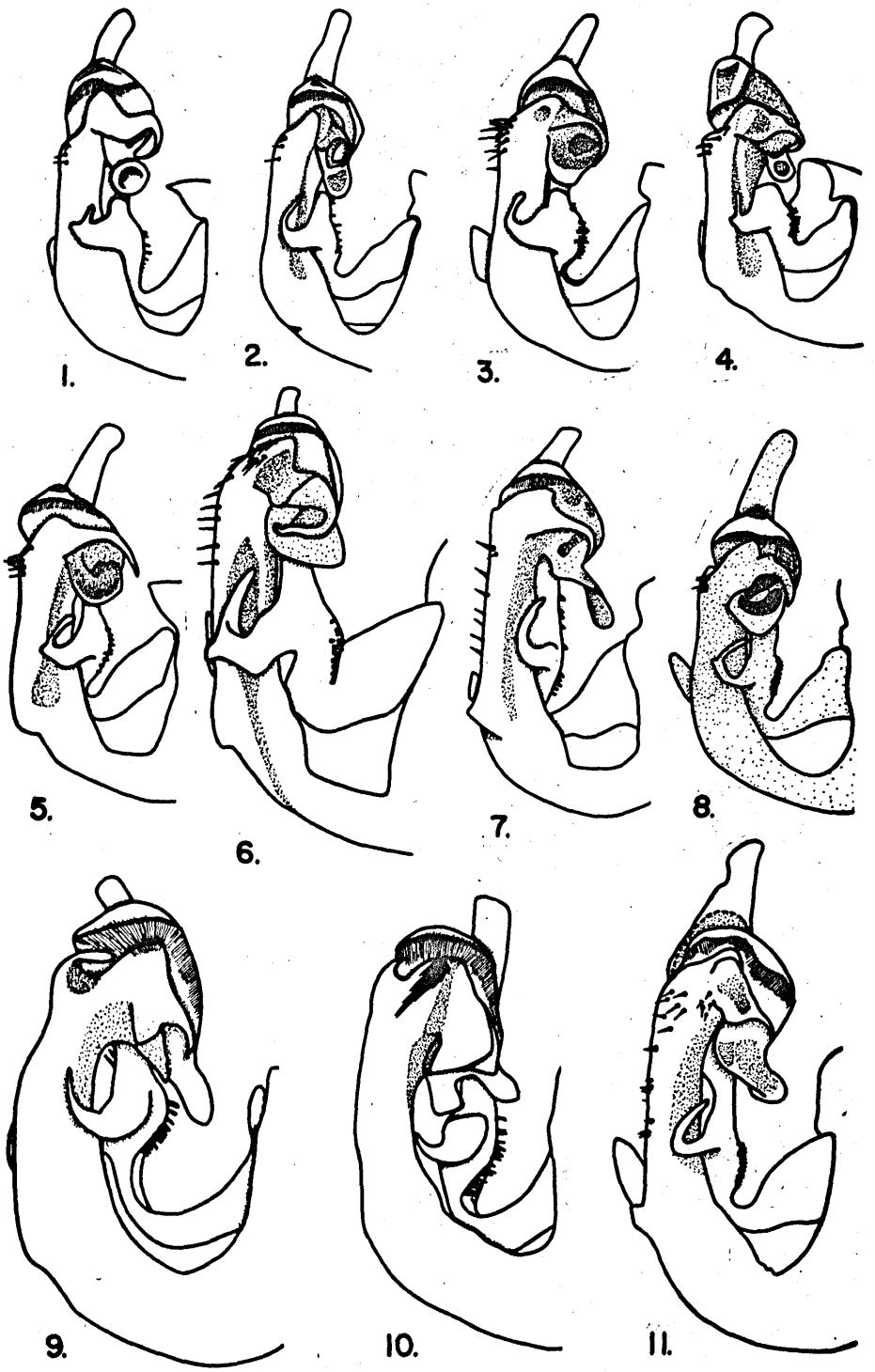


PLATE VII

Clasper of Male X30

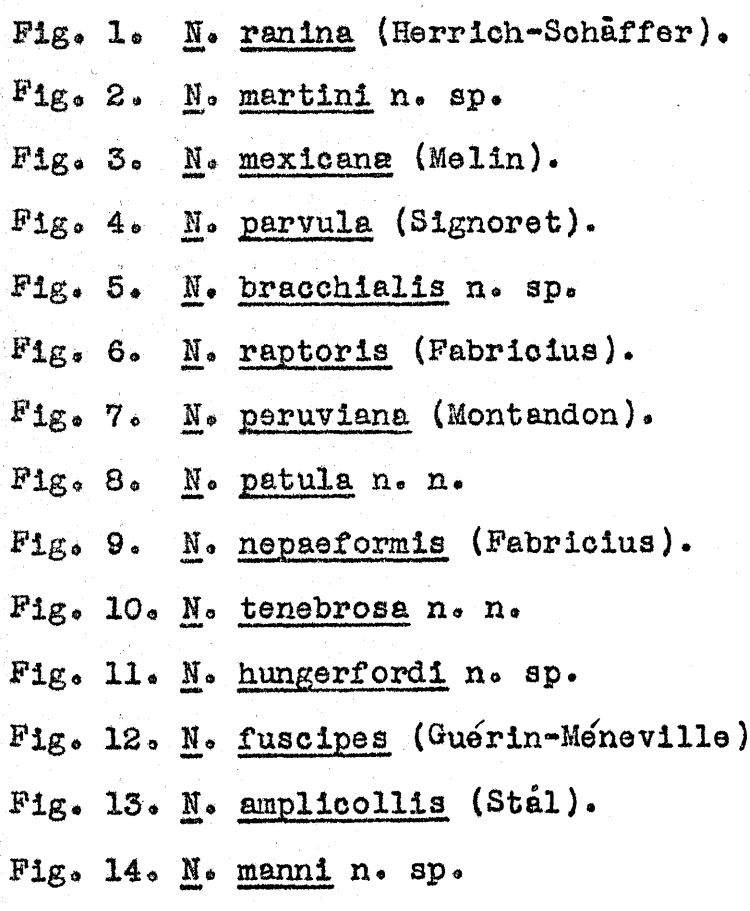


Fig. 1. N. ranina (Herrich-Schäffer).

Fig. 2. N. martini n. sp.

Fig. 3. N. mexicana (Melin).

Fig. 4. N. parvula (Signoret).

Fig. 5. N. bracchialis n. sp.

Fig. 6. N. raptoris (Fabricius).

Fig. 7. N. peruviana (Montandon).

Fig. 8. N. patula n. n.

Fig. 9. N. nepaeformis (Fabricius).

Fig. 10. N. tenebrosa n. n.

Fig. 11. N. hungerfordi n. sp.

Fig. 12. N. fuscipes (Guérin-Méneville).

Fig. 13. N. amplicollis (Stål).

Fig. 14. N. manni n. sp.

PLATE VII

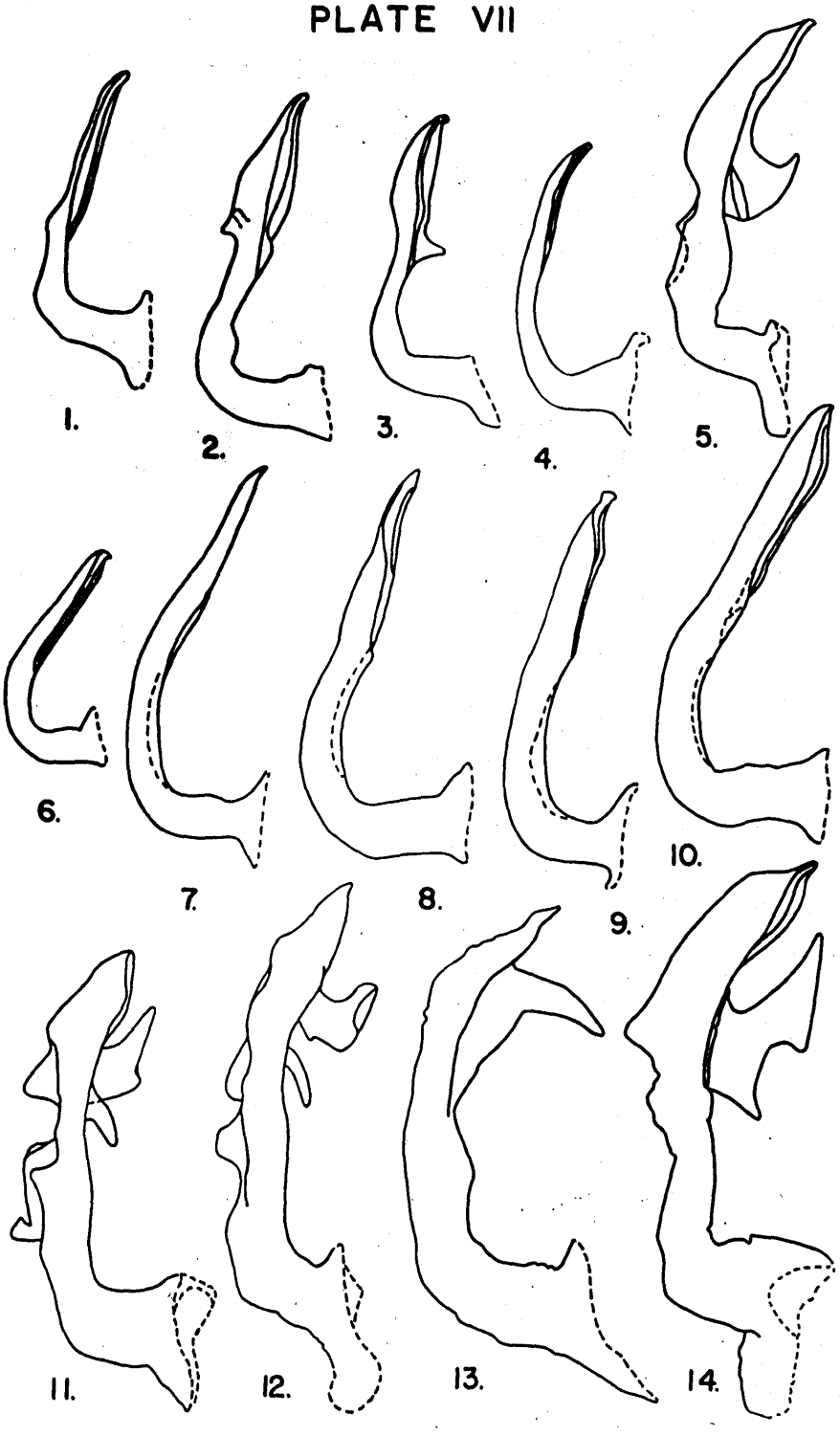


PLATE VIII

Fig. 1. N. montandoni (Melin). Ventral abdominal segments and clasper of male. X10

Fig. 1a. N. montandoni (Melin). Portion of male clasper. X30

Fig. 2. N. ater (Melin). Ventral abdominal segments and clasper of male. X10

Fig. 2a. N. ater (Melin). Portion of male clasper. X30

Fig. 3. N. unicornis (Melin). Ventral abdominal segments and clasper of male. X10

Fig. 3a. N. unicornis (Melin). Portion of male clasper. X30

Fig. 4. N. eucadorensis (Melin). Portion of male clasper. X30

Fig. 5. N. borealis (Melin). Portion of male clasper. X30

Fig. 6. N. hungerfordi n. sp. Ventral abdominal segments of male. X10

Fig. 7. N. tenebrosa n. n. Ventral abdominal segments of male. X10

Fig. 8. N. patula n. n. Ventral abdominal segments male. X10

Fig. 9. N. fuscipes (Guérin-Méneville). Ventral abdominal segments of male. X10

Fig. 10. N. raptoria (Fabricius). Ventral abdominal segments of male. X10

Fig. 11. N. peruviana (Montandon). Ventral abdominal segments of male. X10

Fig. 12. N. manni n. sp. Ventral abdominal segments of male. X10

Fig. 13. N. parvula (Signoret). Ventral abdominal segments of male. X10

Fig. 14. N. amplicollis (Stål). Ventral abdominal segments of male. X10

PLATE VIII

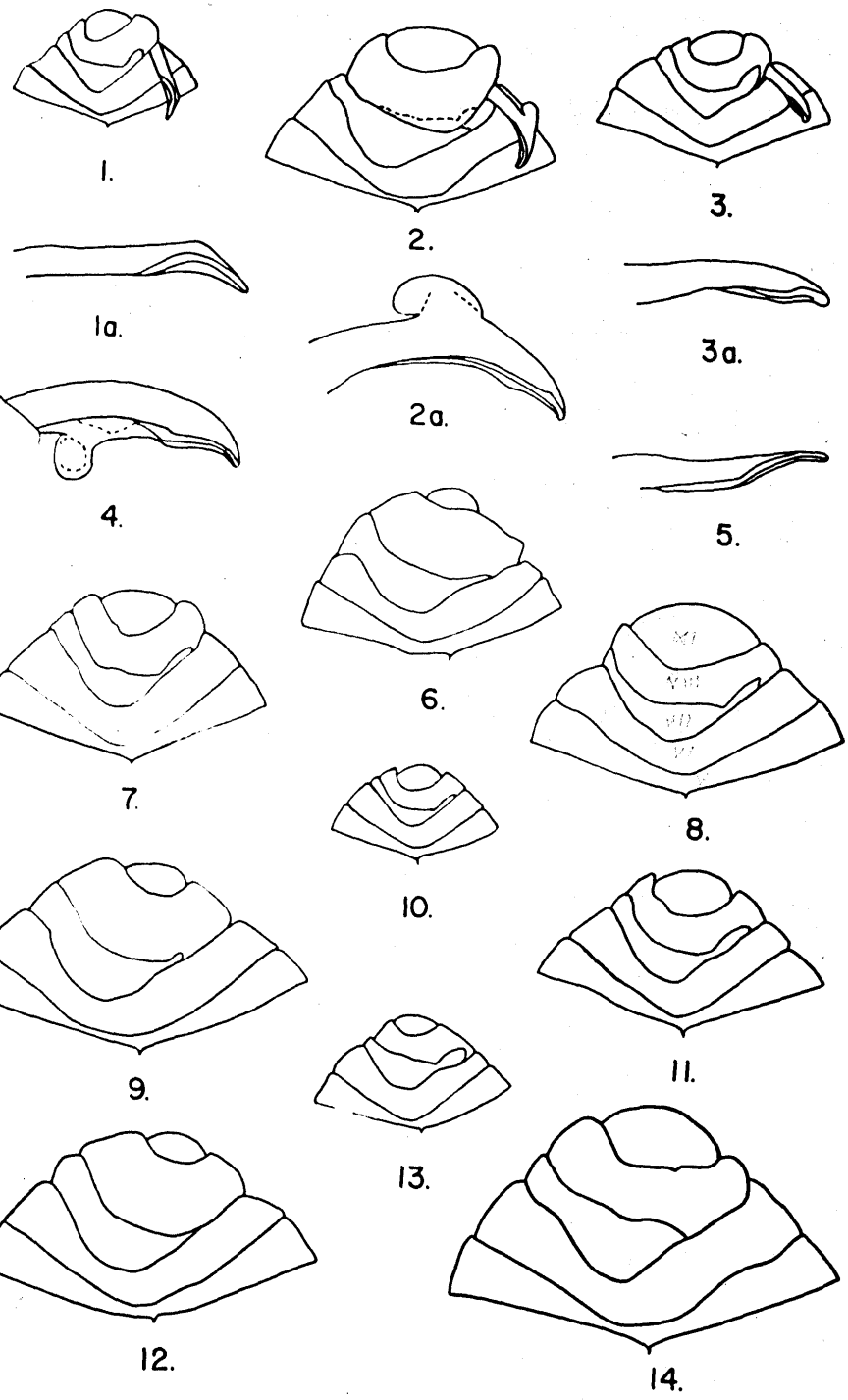


PLATE IX

Fig. 1. N. mexicana (Melin). Ventral abdominal segments of male. X10

Fig. 2. N. martini n. sp. Ventral abdominal segments of male. X10

Fig. 3. N. bracchialis n. sp. Ventral abdominal segments of male. X10

Fig. 4. N. nepaeformis (Fabricius). Ventral abdominal segments of male. X10

Fig. 5. N. ecuadorensis (Melin). Ventral abdominal segments of male. X10

Fig. 6. N. nepaeformis (Fabricius). Front margin of head. X30

Fig. 7. N. martini n. sp. Front margin of head. X30

Fig. 8. N. fuscipes (Guérin-Méneville). Front margin of head. X30

Fig. 9. N. unicornis (Melin). Front margin of head. X30

Fig. 10. N. hungerfordi n. sp. Ventral abdominal segments of female. X10

Fig. 11. N. bracchialis n. sp. Ventral abdominal segments of female. X10

Fig. 12. N. manni n. sp. Ventral abdominal segments of female. X10

PLATE IX

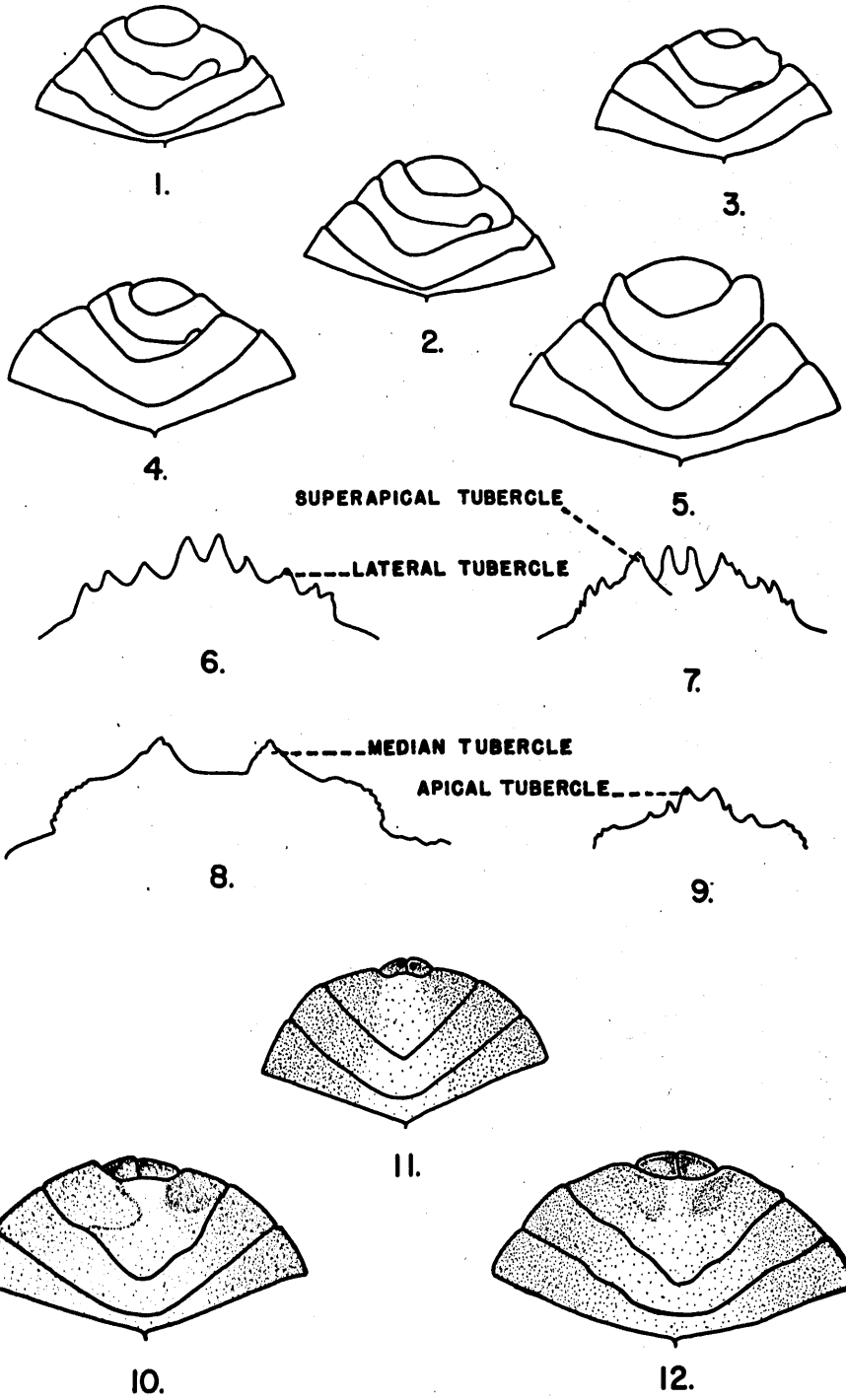

1.
2.
3.
4.
5.
SUPERAPICAL TUBERCLE
LATERAL TUBERCLE
6.
7.
MEDIAN TUBERCLE
APICAL TUBERCLE
8.
9.
11.
10.
12.

PLATE X

Ventral abdominal segments of female. X10

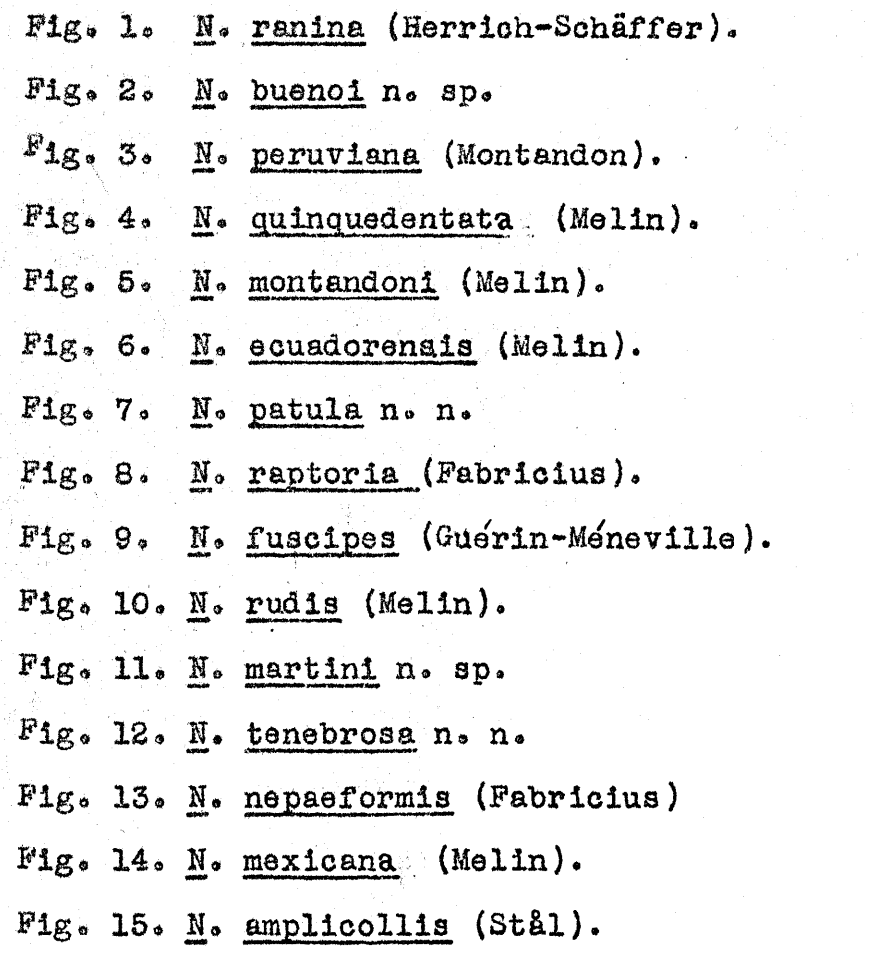


Fig. 1. N. ranina (Herrich-Schäffer).

Fig. 2. N. buenoi n. sp.

Fig. 3. N. peruviana (Montandon).

Fig. 4. N. quinquedentata (Melin).

Fig. 5. N. montandoni (Melin).

Fig. 6. N. ecuadorensis (Melin).

Fig. 7. N. patula n. n.

Fig. 8. N. raptoria (Fabricius).

Fig. 9. N. fuscipes (Guérin-Méneville).

Fig. 10. N. rudis (Melin).

Fig. 11. N. martini n. sp.

Fig. 12. N. tenebrosa n. n.

Fig. 13. N. nepaeformis (Fabricius)

Fig. 14. N. mexicana (Melin).

Fig. 15. N. amplicollis (Stål).

PLATE X

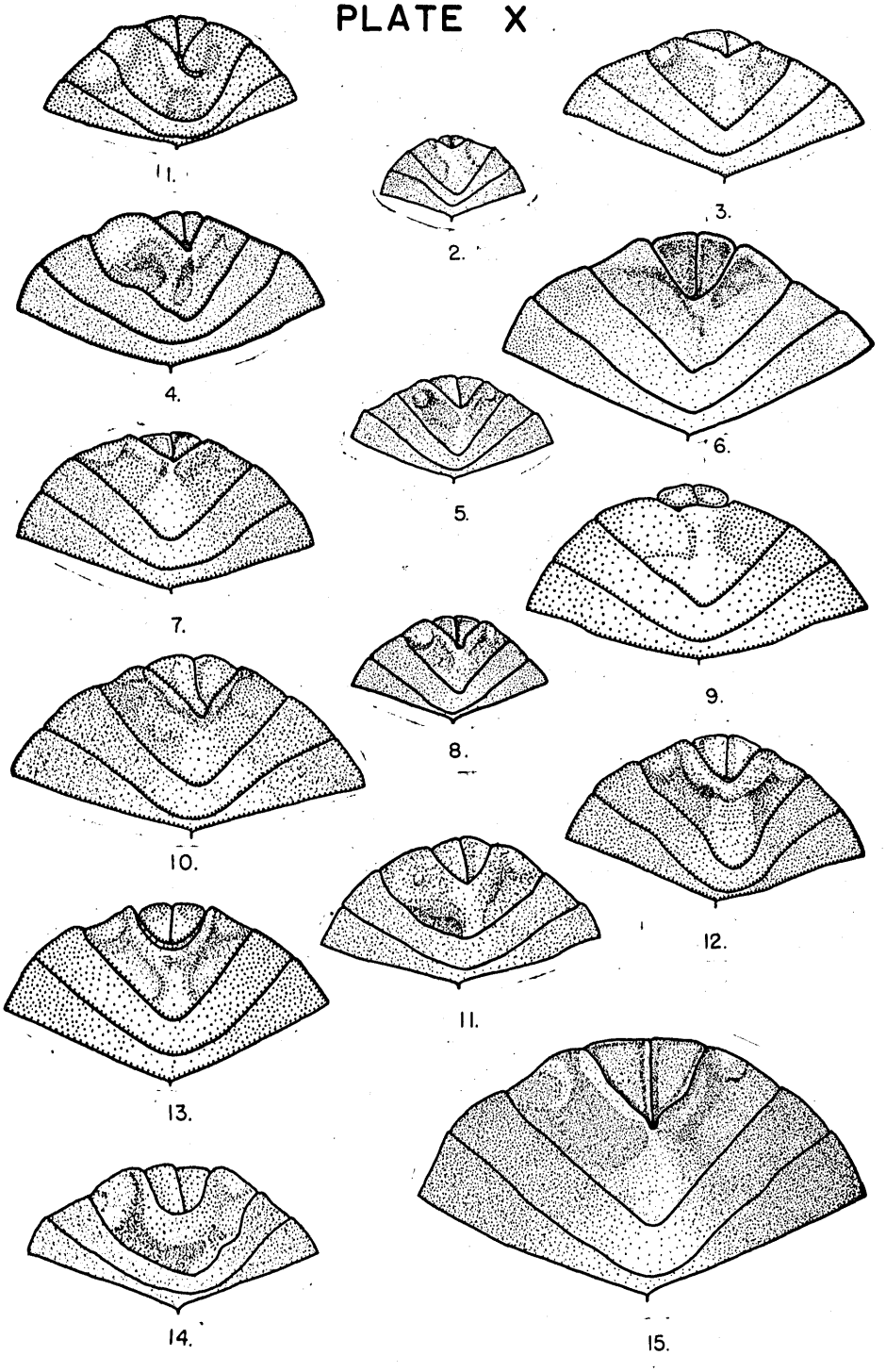


PLATE XI

Male claspers. X30

Fig. 1. N. grandicollis (Germar)

Fig. 2. N. lobata (Montandon).

Fig. 3. N. indica (Atkinson).

Fig. 4. N. nudata n. sp.

Fig. 5. N. omani n. sp.

Fig. 6. N. spissa (Distant).

Fig. 7. N. robusta n. sp.

Fig. 8. N. macrostyla n. sp.

PLATE XI

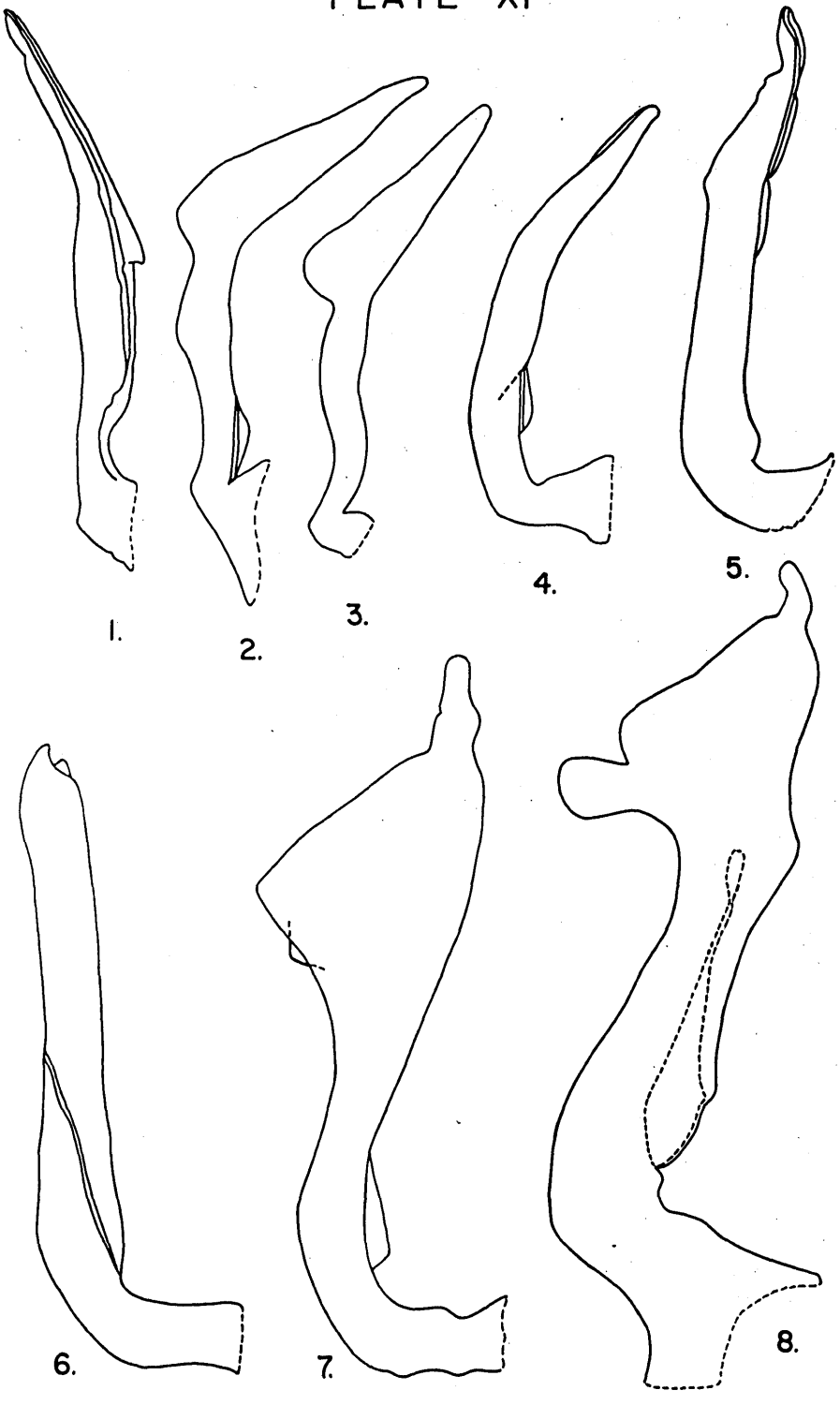


PLATE XII

Male Claspers. X30

Fig. 1. N. tuberculata (Montandon).

Fig. 2. N. femoralis (Montandon).

Fig. 3. N. grandis (Montandon).

Fig. 4. N. luteovaria (Distant).

Fig. 5. N. laticollis (Guérin-Méneville)

Fig. 6. N. gurneyi n. sp.

Fig. 7. N. stygica Say. Portion.

Fig. 8. N. ampliata (Montandon).

Fig. 9. N. williamsi n. sp.

Fig. 10. N. macrothorax (Montrouzier). Portion.

Fig. 11. N. alaticollis (Stål).

Fig. 12. N. americana (Montandon).

Fig. 13. N. mixta (Montandon). Portion.

PLATE XII

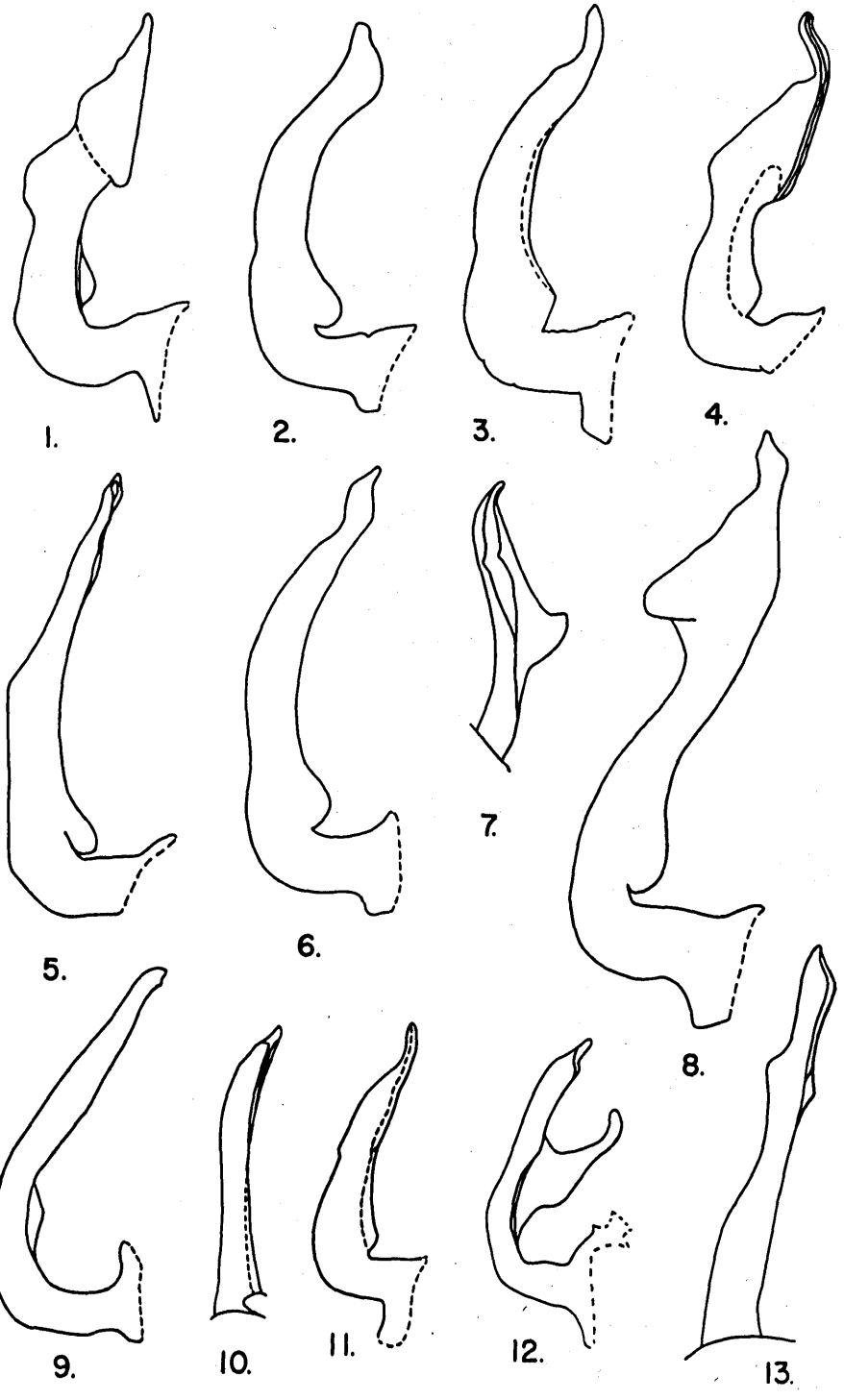


PLATE XIII

Fig. 1. N. stygica Say. Ventral abdominal segments of female. X10

Fig. 2. N. alaticollis (Stål). Ventral abdominal segments of male. X10

Fig. 3. N. macrothorax (Montrouzier). Ventral abdominal segments of male. X10

Fig. 4. N. americana (Montandon). Dorsal view of male. X10

Fig. 5. N. rugosa (Desjardins). Dorsal view of female. X10

Fig. 6. N. adspersa (Stål). Dorsal view. X10

Fig. 7. N. grandis (Montandon). Ventral abdominal segments of male. X10

Fig. 8. N. nervosa (Montandon). Portion of pronotum and hemelytron of female. X10

Fig. 9. N. stali (Montandon). Dorsal view of female. X10

Fig. 10. N. grandis (Montandon). Dorsal view of female. X10

PLATE XIII

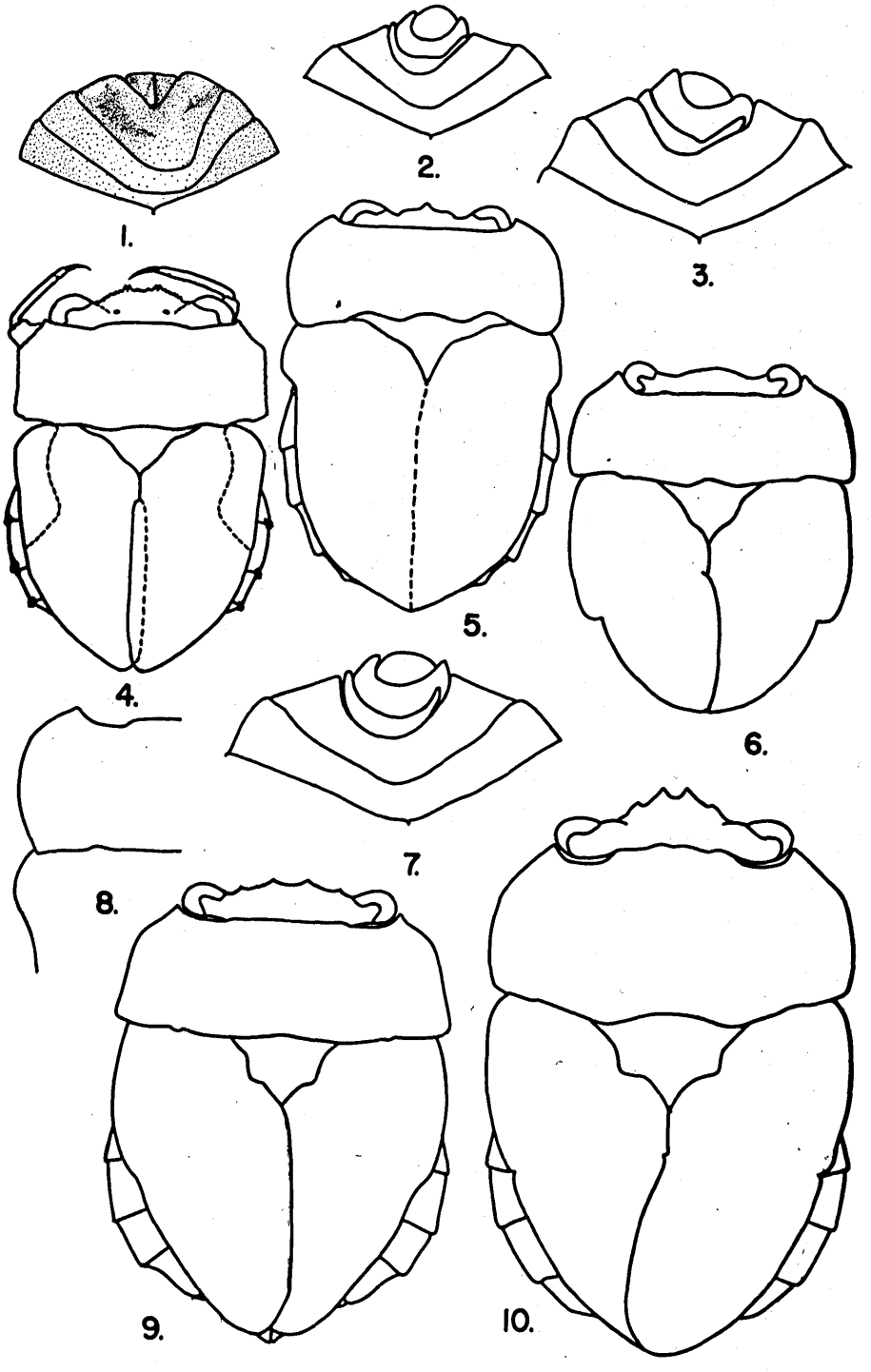


PLATE XIV

Fig. 1. N. alaticollis (Stål). Ventral abdominal segments of female. X10

Fig. 2. N. asiatica (Horvath). Ventral abdominal segments of female. X10

Fig. 3. N. grandis (Montandon). Ventral abdominal segments of female. X10

Fig. 4. N. stygica Say. Dorsal view of female. X10

Fig. 5. N. sinuosa n. sp. Ventral abdominal segments of female. X10

Fig. 6. N. hirsuta n. sp. Ventral abdominal segments of female. X15

Fig. 7. N. stali (Montandon). Ventral abdominal segments of female. X10

Fig. 8. N. sinuosa n. sp. Dorsal view of female. X10

Fig. 9. N. macrothorax (Montrouzier). Dorsal view of female. X10

PLATE XIV

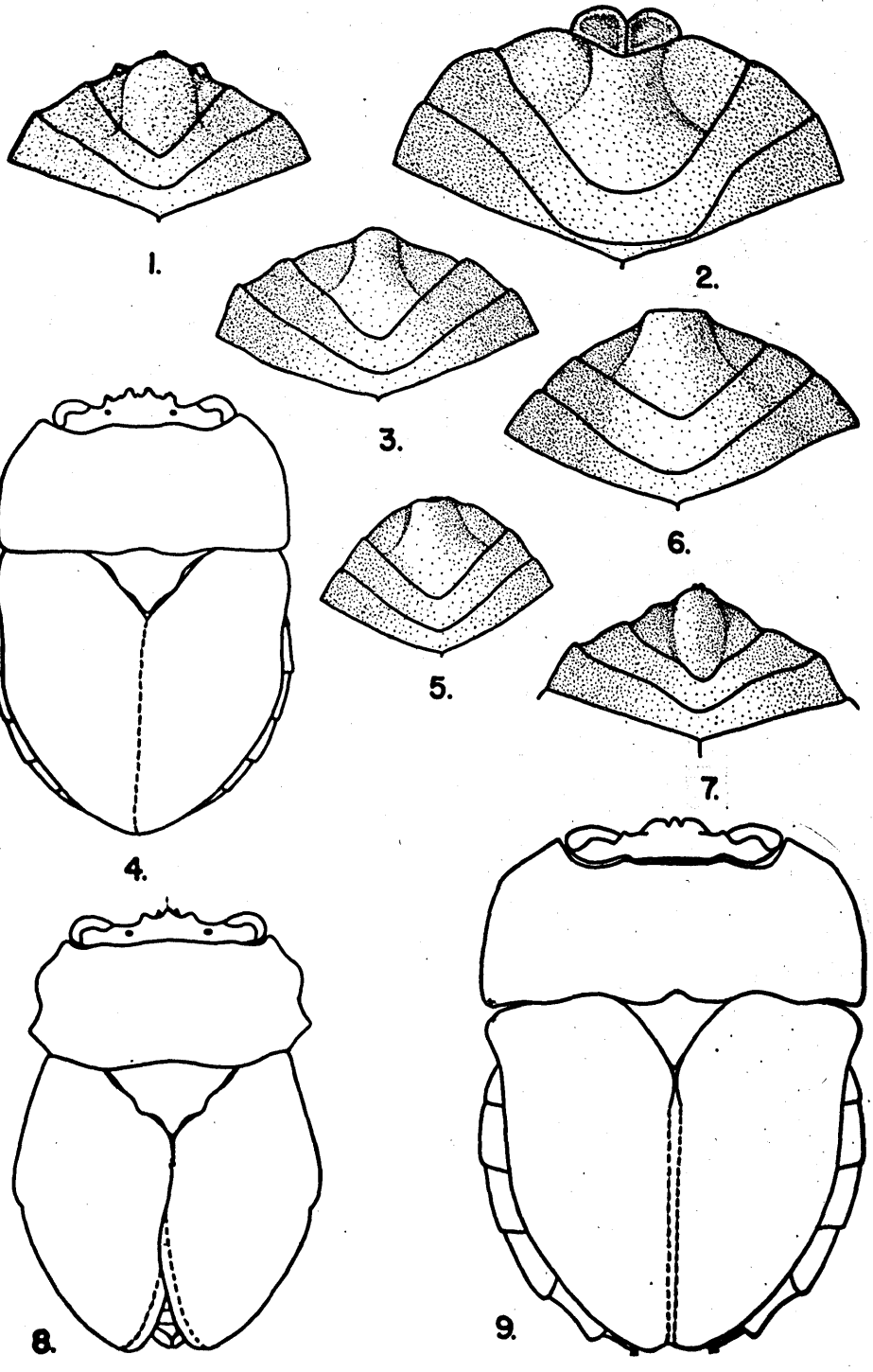


PLATE XV

Fig. 1. *N. luteovaria* (Distant). Ventral abdominal segments of female. X10

Fig. 2. *N. tuberculata* (Montandon). Ventral abdominal segments of female. X10

Fig. 3. *N. lobata* (Montandon). Ventral abdominal segments of female. X10

Fig. 4. *N. laticollis* (Guérin-Méneville). Ventral abdominal segments of male. X10

Fig. 5. *N. robusta* n. sp. Ventral abdominal segments of male. X10

PLATE XV